

MODEL AIRPLANE NEWS

APRIL 1938

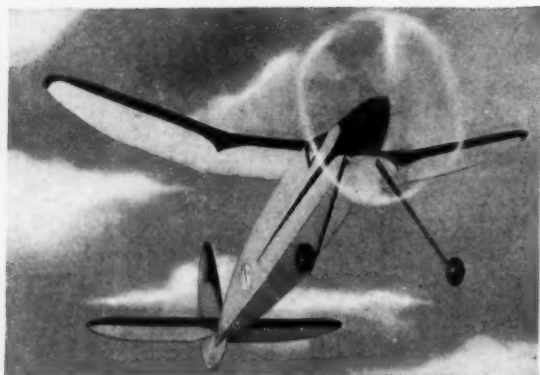
20¢

The Grumman
Mid-wing Fighter

Walt

PROVEN THE WORLD'S BEST FLYING MODEL!

WORLD RECORD HOLDER OF THE OUTDOOR OPEN CABIN EVENT!



KORDA'S 43" WORLD RECORD HOLDER

SIMPLE AS ABC TO BUILD AND FLY!

No claims are necessary! Here is a model that has *proven* its performance. Think of it—a brilliant, spectacular flying model within your reach. Now, you too can go out and win contests! How many times have you been dissatisfied with the flights your models have made? How many hours have you spent attempting models that only were re-designed to fit manufacturing purposes? Well, here's a model that you **KNOW** will fly. It's an exacting, perfectly true duplicate of the model that holds the **WORLD CHAMPIONSHIP**. The same patterns, cross sections, templates—all worked out micrometrically by the world's finest designers. And more—it's as simple as ABC to build. Any beginner can enjoy as successful flights as the most experienced designer. Don't buy experimental models. Get your **PROVEN CHAMPION** at your dealer's **TODAY**. If there is none near to serve you write in direct.

WHAT A BUY!

43" WINGSPAN ... 38" LENGTH

ONLY \$1.00



POSTPAID
OR AT
YOUR
DEALER

This model performs best on a good grade of Special FRESH Contest rubber. To insure freshness, sets are packed without rubber and this is sold as a separate unit.
80 ft. Special Brown Rubber...40c
M & M Air wheels, per pair...30c
Special prop blank...30c
(Saw cut prop furnished in set.)

FREE!

WITH EVERY MOTOR, A FINISHED PROP, BURGESS BATTERY, SAE 70 OIL!



SYNCR-ACE
\$15.00

fast service guaranteed

BROWN MODEL B.....	\$21.50
BROWN MODEL C.....	17.00
OHLSSON	18.50
WATER NYMPH.....	16.50
(Water cooled)	
THE INTERMOT.....	15.00
THE WARRIOR.....	12.00
BURGESS BATTERY.....	.80
FINISHED PROPS.....	1.00
SAE 70 OIL.....	.20

free prop & oil with kits

MIGHTY MIDGET.....	\$14.00 KIT \$ 9.85
MIGHTY MARINE.....	17.75 KIT 11.40
MIGHTY MIDGET (INV.).....	17.25 KIT 10.10
GWIN AERO.....	17.50 KIT 11.35
GWIN AERO (INV.).....	18.25 KIT 11.60



CONDOR
MIDGET \$18.50



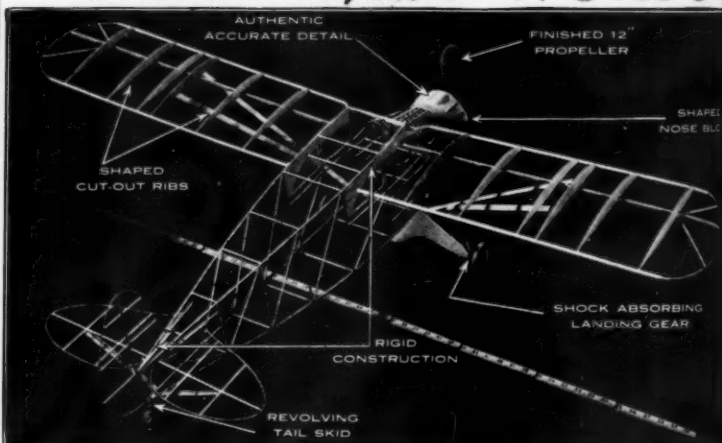
BRAT \$16.50

Free prop, oil and necessary batteries given with all small motors.



TROJAN
\$18.50

ONE PICTURE is Worth 10,000 WORDS!



5 FT. REARWIN SPEEDSTER



5 FT. FAIRCHILD '24'

FAIRCHILD '24' (Structurally)

5 FOOT FLYING MODELS

FULL SIZE PLANS—SHAPED Balsa PROP—GENEROUS QUANTITIES OF GLUE AND DOPE—WIRE—BROWN RUBBER—COLORED TISSUE—HARDWOOD—WHEELS—FINE, GLASS SMOOTH Balsa WOOD, ETC.

\$1.50
POSTPAID OR AT YOUR DEALER

CURTISS ROBIN

A steady, strong, consistent flyer that has started many thousands of model-builders. There have probably been more sets sold for this 'crate' than any other two planes. Its popularity will never die as we will always remember its work in pioneering. Many beginners prefer this model because of its simplicity in construction. Colored orange and yellow, black trimmings.



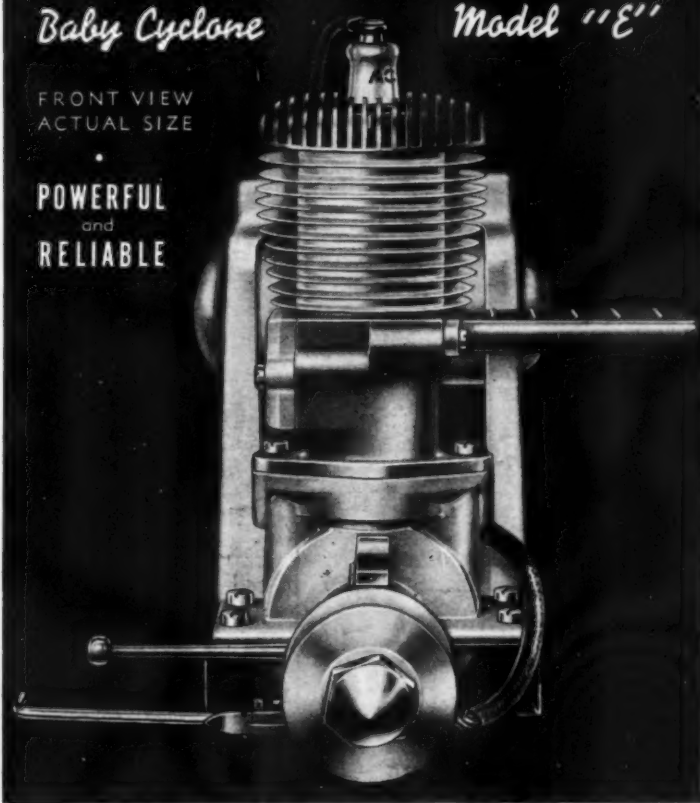
DEALERS: GET OUR PROPOSITION, IT PAYS

BURD

MODEL AIRPLANE COMPANY

101-105 West Pratt Street Baltimore, Maryland

IN ENGLAND: Elite Model Planes, 14 Bury New Rd., Manchester
IN SWEDEN: Sven Wentzel, Apelbergsgatan 54, Stockholm
IN AUSTRALIA: K. Deo, Ltd., 113b Bathurst, Sydney
IN SOUTH AFRICA: Model Aircraft (Pty.) Ltd., 23 Dock Rd., Capetown

*Baby Cyclone**Model "E"*FRONT VIEW
ACTUAL SIZEPOWERFUL
and
RELIABLE

Win Meets - BE A CHAMPION

REMEMBER THAT—

The famous Baby Cyclone has beaten every engine in the world in competition and is the undisputed World's Champion.

- It can only be purchased direct from the manufacturer (Aircraft Industries) in the U.S.A.
- It has won for others and it will win for you.
- Own the BEST engine in the world and win meets regularly.

SEND YOUR MONEY ORDER FOR \$12.50 — TODAY

EVERY ENGINE IS BLOCK TESTED AND GIVEN FULL THROTTLE RUN BY THE FACTORY EXPERTS BEFORE SHIPMENT TO INSURE PERFECTION.

"CYCLONE SERVICE" —→ Your engine positively will be shipped on same day your order is received

PRICE IN ALL FOREIGN COUNTRIES EXCEPT CANADA \$25.00

ORDER BLANK

AIRCRAFT INDUSTRIES GRAND CENTRAL AIR TERMINAL, GLENDALE, (LOS ANGELES) CALIF.

ATTENTION C. C. MOSELEY, President

Sir: Please send me postpaid the following items checked. I enclose Post Office money order.

☐ **BABY CYCLONE ENGINE MODEL "E" . . \$12.50**

☐ California "Champ" Kit, Complete, \$10.00
(Kit weighs three pounds, wing span five feet)

☐ California "Chief" Kit, Complete, \$7.90
(Kit weighs three pounds, wing span five feet)

☐ Hardwood Propeller \$1.50

☐ COMBINATION "Champ" Kit, propeller and engine, \$17.85

☐ COMBINATION "Chief" Kit, propeller and engine, \$15.75

SHIP TO _____ Age _____ ADDRESS _____ N-4

**BUY THE
BEST
ENGINE IN
THE WORLD**

CHAMPION OF

United States
Germany
England
France





Model AIRPLANE News

9th YEAR OF PUBLICATION

VOL. XVIII

No. 4

Edited by Charles Hampson Grant

CONTENTS

APRIL, 1938

An American View of German Aviation By Frank Zaic.....	6
How to Build the Arrow Speedster By Louis Garami.....	8
Soaring Flight By L. J. Lesh.....	11
Frontiers of Aviation. Including: How to Build a Scale Model of the Consolidated Patrol Bomber XPB2Y-1 By Robert C. Morrison.....	12
"You and Your Job" By Willis L. Nye.....	15
Building the Midget "Cavu" By Ken Willard.....	16
N. A. A. Junior Membership News.....	20
"Gas Lines".....	22
Build and Fly This Miniature Monocoupe By Robert J. Hammer.....	24
How Big Shall My Gas Job Be? By Charles Hampson Grant.....	29
Air Ways—Here and There.....	30
A World Record Class "B" Indoor Fuselage Model By John Ginetti.....	34
How Much Horsepower? By Cyril S. Finegold.....	35

NOTICE

This entire magazine, as well as each and every part thereof, is protected by copyright in the United States and foreign countries. No person, firm or corporation has the right to reproduce the whole of this magazine or any part thereof in any form or fashion. All reproduction rights of any kind are exclusively reserved by the publisher of this magazine. Copyright under international copyright convention. Any infringement will be prosecuted to the fullest extent of the law.

Published Monthly by JAY PUBLISHING CORP., Mount Morris, Illinois.
Editorial and General Offices, 551 Fifth Avenue, New York City.
George C. Johnson, President. Jay P. Cleveland, Secretary.
Jay P. Cleveland, Advertising Manager, 551 Fifth Avenue, New York, N. Y.
Entered as second-class matter Dec. 6, 1934, at the post office at Mount Morris, Ill., under the act of March 3, 1879. Additional entry at New York, N. Y.
Copyright 1938 by JAY PUBLISHING CORP.
Price 20c a copy. Subscription price \$1.65 a year in the United States and its possessions; also Cuba, Mexico and Panama.
\$1.65 in Canada. All other countries \$2.50 per year.
Contributors are especially advised to be sure to retain copies of their contributions, otherwise they are taking unnecessary risk. Every possible effort will be made in our organization to return unavailable manuscripts, photographs and drawings (if accompanied by postage), but we will not be responsible for any loss of such matter contributed.

HEADQUARTERS

for all

HOBBYCRAFTERS

From the most highly favored gas-powered airplane model kits, on through a long line of flying and detail scale models, boat and ship model kits, model builders' materials and ready-made parts, Megow's is headquarters for all Hobbycrafters. Sponsored by noted aviators and developed by our own staff of Research Engineers and Designers, Megow products have advantages that every experienced model builder understands and appreciates.



Span 67 in. Length 47 in. Use any model airplane engine. Wings removable and gear folds back for carrying.

\$4.95 3 1/4 in. rubber wheels. Two full size plans, 28 in. x 34 in. with clear photos. Extra hard balsa wood cut to sizes. Special steel wire, celluloid, aluminum for cowl and bamboo paper, cement, etc.

GAS-POWERED SCALE MODELS!

Now you can easily and quickly build actual scale models of America's favorites that will fly high and long when powered by a motor similar to the Tailor Cub shown below.



- TAILOR CUB.** Scale 2 1/4 in. - 1 ft. Span 79 1/2 in. (Shown above) **\$8.50**
ART CHESTER "JEEP". Scale 4 in. - 1 ft. Span 71 1/2 in. **\$12.00**
HOWARD DGAS. Scale 2 in. - 1 ft. Span 76 in. **\$12.50**
SILVER FLIER. Span 72 in. Length 40 in. **\$6.50**
FAIRCHILD DELUXE RANGER "24". Scale 4 1/4 in. - 1 ft. Span 80 1/2 in. **\$10.00**
STINSON RELIANT. Scale 2 in. - 1 ft. Span 83 1/2 in. **\$14.50**
U. S. ARMY PURSUIT. Scale 1 1/2 in. - 1 ft. Span 59 1/2 in. **\$8.00**
LUSCOMBE PHANTOM. Scale 2 1/4 in. - 1 ft. Span 76 in. **\$14.00**
MONOCOUCPE 90. Scale 2 7/16 in. - 1 ft. Span 76 1/4 in. **\$12.50**

By mail, 50c additional for postage.

GASOLINE MOTORS



Very popular streamlined design, enhancing appearance and operation of any flying model. Developed by leading dynamics engineer. Long life, easy starting, precision finish—all parts interchangeable. 1/5 h. p. Factory tested, mounted on skids, ready to run.

Including Propeller **\$15.00**

MISS STRATOSPHERE

Approved By

Charles G. Chamberlain



60c plus 10c postage

Exact 1/2-in. scale model kit of Col. Chamberlain's high altitude ship, introducing a new type of construction using wood veneer.



MONOCOUCPE 90A

Exact outline scale model of a much-liked two-place sport plane. Very stable flier. 30 in. wingspan. **50c plus 10c postage**

ARROW
SPORT
V-8

Authentic detail model of an outstanding Ford V-8 powered sport plane. 30 in. wingspan. **50c plus 10c postage**

AERONCA K

50c
plus 10c postage



A new development of the famous Aeronca C3. In place of old wire bracing, wing struts are now used. 30 in. wingspan.



MODEL SPEED BOAT

Balsa construction—light, fast, easy to build. Kit contains clock mechanism with motor and propeller in one complete unit, capable of 800 feet, or five to seven minute, drive. **\$1.95 plus 15c postage.** With elec. outboard motor less batteries, **\$4.95 plus 15c postage.**

SHIP MODELS

Most extensive line of model kits and supplies for boat and ship model builders. Authentic models... romantic, historical, and modern.

Prices from **10c** to **\$6.00.**

MAYFLOWER Close reproduction of the famous Pilgrim ship. Length 17 1/2 in. Printed deck-piece construction, **\$2.50.** With Carved Hull, **\$3.00.** Add 15c post.

10c

See the
NEW ARROW
Ready-To-Fly
R. O. G.
Airplanes

At Your Dealer's Only



Look for this Counter
Display Box!

METAL PARTS for
Airplanes and Boats

Megow dealers are now carrying complete stocks of Metal Parts indexed on the front of this new Counter Cabinet for your easy selection. Parts usually hard to get, in various sizes and kinds.

Send 5c postage for Complete Illustrated Catalog!

MEGOW'S

Dept. MA, Howard and Oxford Streets, Philadelphia, Pa.
or 217 N. Desplaines Street, Chicago, Ill.

Aer-O-Kits—Sheffield, England. A. Wernaar, Voorburg, Holland
American Products, Tienen-Tirlemont, Belg. Eskader, Stockholm,
Sweden. K-DEE PTY., Ltd., Sidney, Australia.

Please send me

- ☐ SCALE GAS-POWERED KIT.....
☐ MISS STRATOSPHERE
☐ MONOCOUCPE 90A
☐ ARROW SPORT V-8
☐ AERONCA K
☐ SYNCRO ACE MOTOR
☐ QUAKER FLASH
☐ MODEL SPEED BOAT
☐ MAYFLOWER
☐ Reg. ☐ Carved Hull
☐ CATALOG

Money Order for \$..... is enclosed

Name.....

Address.....

City.....

State.....

\$1500.

IN PRIZES FOR NEW MODEL IDEAS FROM REG. DENNY!



Build a rubber-powered Denny flying model plane with your own improvements. You have as much chance as the other fellow to win one or more of these 124 prizes.

- 4 First-Prizes of \$150; 1 for EACH of the four Denny models:
Starling, Skylark, Condor and Bullet.....total \$600
- 4 Second-Prizes of \$50; 1 for EACH of the four models.....total \$200
- 4 Third-Prizes of \$30; 1 for EACH of the four models.....total \$120
- 4 Fourth-Prizes of a Denny Jr. gas model kit, COMPLETE with
ready-to-run 1938 Denny-mite motor.....total \$104
- 4 Fifth-Prizes of a Denny-mite motor; 1 for EACH of the four
modelstotal \$68
- 4 Sixth-Prizes of a Denny Jr. gas kit; 1 for EACH of the four
models. (Certified N. A. A. flight, 1 hr. 47 min., 6-10 sec.).....total \$38
- 100 Additional Prizes of a Condor Kit; 25 for EACH of the four
modelstotal \$100

(And prizes to dealers who sell Kits to winners; \$1502 in all.)

Get double fun from plane building this spring! You'll be making flying models anyway—build Dennys and take a chance for these big prizes. You'll have more fun and better flying with kits as fine in design and quality as these. Get acquainted now! . . . a lucky discovery may bring you one or more of the four \$150.00 first prizes. We're constantly in search of new improvements, and willing to pay you for your ideas.

Anyone Can Win

Everyone is eligible to compete (except Denny employees). Any plane built during March or April may be entered. Whether you've previously built one or a hundred models, you have an equal chance. *It's new ideas we want*—any kind of improvement may win. Entries will be judged simply on improved performance, or improved appearance, or a clever construction feature, or a combination of all.

Simple Rules

There's no entry fee. You don't have to buy anything. You can use any of the 4 standard Denny kits or else use your own materials—just so they're identical in size and quality with a Denny kit. The only requirement for competition is that each entry have

some change or improvement over the original kit. Your entry blank (which must be enclosed carefully with each plane you send) is the large word DENNY, printed in script on all tubes and box tops (labels from the sides of boxes cannot be accepted)—or you may use a reasonable facsimile thereof. Simply cut this section out of the package and print your name, address, city, and the name of your dealer on the back. (Read rules and regulations in box at right carefully.)

One Hundred and Twenty-Four Prizes

Equal prizes are offered for each class of plane—the Denny Starling, Skylark, Condor, and Bullet. You can enter in any or all of these classes. In addition to the 24 prizes for usable improvements, one hundred \$1.00 Condor kits will be given for entries that are particularly unique or carefully made.

Entries Close May First

Prizes will be announced and paid by May 30th, 1938—so all entries must be shipped by May first. Each plane must be completely assembled except that the wing may be detached. Shipping is easy and inexpensive—if you're in doubt about how to pack, ask your dealer or write for easy illustrated shipping plan.

Famous Pilots and Designers are Judges

Lawrence W. Brown, plane designer; Charles H. Grant, Editor of Model Airplane News; Paul Mantz, Pilot and Technician are among those who will judge your entries, their decision will be final. Qualified model builders and flyers, and members of the Junior Birdmen of America, will fly and exhibit all planes. Never before has a manufacturer offered such an opportunity to have real fun and compete for such prizes at the same time!

Where to Get Contest Kits

See your dealer . . . he has complete information and deserves your support! But if he doesn't have them, use the coupon below. And be sure to write in the name of the dealer where you tried to buy. We'll send your kit to you by return mail the day we get your order, so you can start right in for one or more of these prizes.

Reginald Denny Industries
5751 Hollywood Blvd.
Hollywood, California

**IF NECESSARY
ORDER BY MAIL**

Enclosed find cash (at my own risk) or money order for the prepaid price of model checked below for which send me Denny kit by return mail.

☐ Starling 25c ☐ Skylark 50c ☐ Condor \$1 ☐ Bullet \$1.25

Name _____

Address _____

City _____

Dealer's Name _____

Address _____

City _____

(California customers [only], please include 3% California Sales Tax.)

... on ideas and discoveries ... have fun at the same time

EACH DENNY KIT IS A CHAMPION IN ITS CLASS!



**Kit 25c
COMPLETE**

Denny STARLING

Identical in style and quality with the larger models. Designed for greatest simplicity in assembling. A splendid flyer with a record of 2 minutes and 20 seconds. Wingspan 18 inches.



**Kit \$1.00
COMPLETE**

Denny CONDOR

Tests everywhere show amazing climb and phenomenal glide—it will outperform all standard models in its class. Kit contains extra wood, cement and dope. Wingspan 32 inches.



**Kit 50c
COMPLETE**

Denny SKYLARK

Experienced model-flyers buy Skylarks again and again—we know no better proof of fine quality and performance. Compare this with anything near the price! Wingspan 24 inches.



**Kit \$1.25
COMPLETE**

Denny BULLET

Crack-proof! A fast climber that will hit 40 m.p.h. and glide like the finest endurance models. Ultra streamlined, low wings, adjustable rudder and stabilizer! Wingspan 25 inches.

A model is only as good as the materials you put in it. Denny kits give you the finest materials obtainable. Good hard balsa wood, generous bottles of Berryloid dope and cement. Paper—the best we can buy. A 10% over-supply of material in every kit. Experts praise our plans and instructions. All kits are precision inspected before leaving assembly line.

The big Denny prize contest offers you spectacular prizes for new ideas in your favorite hobby. You'll be building models this spring anyway, so concentrate on Denny kits for more fun, more excitement, and prizes! Simply "build in" an improvement to one of these famous flyers. Read complete details at left for easy rules and big prizes.

RULES AND REGULATIONS

Reginald Denny Contest for Improved Models

This contest is sponsored by Reginald Denny Industries solely to seek improvements in rubber-powered flying plane models, believing that improvements can best come from the men and boys who actually assemble and fly these planes. Every effort has been made to make the event easy and entertaining for everyone. The following simple rules must be observed.

1. Anyone can enter, except Denny employees.
2. All entries must bear express or postal date not later than May 1, 1938. Prizes will be announced and paid on May 30, 1938.
3. 148 prizes are offered, 124 for contestants and 24 for dealers from whom materials are purchased. Total value of prizes \$1502.00—see complete list at left.
4. Prize awards are divided into 4 equal groups—Starling, Skylark, Condor, and Bullet models. Contestants may enter in any or all classes and are eligible for one prize in each class.
5. There is no entry fee and it is not necessary to buy anything. Entrants may use any of the 4 standard Denny kits named above, or they may use their own materials provided they are identical in size and quality with said kits.
6. Entries will be accepted only if they contain some change or improvement from the original design. However, they must remain the same general type as the class entered and must not borrow changes from other manufacturers' models.
7. Each entry must be accompanied by the large word, DENNY, printed in script on all tubes and box tops (labels from the sides of boxes cannot be accepted)—or you may use a reasonable facsimile thereof. Simply cut this word from the package, write your name, address, and the name of the dealer from whom you bought your materials on the back. This card is your entry blank and must be securely fastened to your entry, inside the shipping box.
8. Entries must be sent prepaid to Reginald Denny Industries, 5751 Hollywood Boulevard, Los Angeles, California. We can not accept any responsibility for injury in transit. The act of mailing such entry automatically assigns all right and title in it, and full title to its design, to Reginald Denny Industries. Payment of a prize for a winning entry is full consideration for title to said design. No entries will be returned—after the contest they will be given to orphanages and hospitals.
9. Entries will be accepted only if completely assembled, except that wings may be detached for greater ease in shipping.
10. Entries in each class will be judged and prizes awarded for the best improvement in performance, appearance, construction features, or a combination of all. The decisions of the judges will be final.

Reginald Denny Industries

5751 Hollywood Blvd., Hollywood, California

DEALERS ATTENTION: We have prepared for you to share in this contest by giving you prizes, special deals, advertising displays—every known means of bringing you business.

Be Headquarters in Your Neighborhood

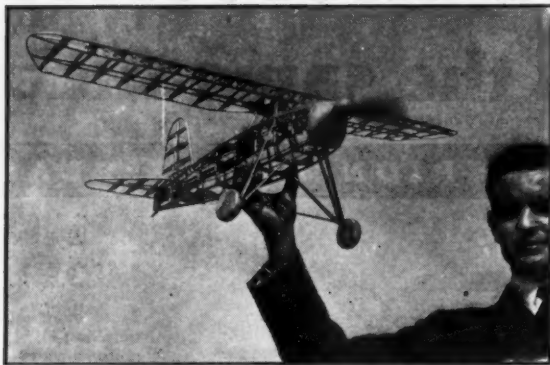
Your part in this nation-wide Denny Contest has been carefully planned. *There are big prizes for you, too!* Special bigger-profit deals! Banners! Display pieces! *Everything* to tie you right into the "picture." We want your cooperation—we want to cooperate with you. Use the air mail coupon, now! We'll rush you all the particulars about how this Contest means extra profits to you.

Reginald Denny Industries
5751 Hollywood Boulevard
Hollywood, California

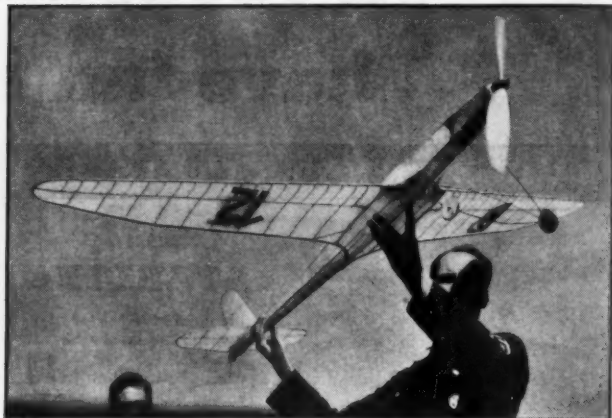
**DEALERS!
AIRMAIL
NOW!**

Rush me complete details of your plan for more dealer's profits.

Name _____
Address _____
City _____ State _____
Also send me the following kits less regular dealer discounts and special profit-allowance for contest. Include all sales-help materials.
Denny Starlings _____ Denny Skylarks _____
Denny Condors _____ Denny Bullets _____
If you have not already an account with us, be sure to send check, money order, credit references or else state you prefer shipment C.O.D.



A plane with frame made entirely of metal.



Here is a type of model that is typically German. It is a slim bodied "low-wing" held by Gunther Meruch, its builder.

An American View of German Model Aviation

Pertinent Points of Interest Concerning the Methods of Building and Flying Model Planes in Germany

By FRANK ZAIC



Mr. Lippisch shows his "flapper" to Major Schroter and some friends.

HOW small indeed is the world! And how well the Good Lord takes care of his model builders! There I was, at the end of my *schnellzug* line, not knowing where to turn for the local train, Dulmen bound. And right there before my very eyes were big plywood boxes and paper wrapped packages that could only contain wings and tails judging from their irregular appearances, surrounded by boys and men dressed in natty uniforms with flying badges prominently displayed. It was not long before I was one of them, greatly pleased to find among them a friend and a fellow teacher of Mr. Ledertheil, my German correspondent.

I will explain the circumstances which brought me almost 600 miles into north-western Germany, from where I was staying in Southern Europe. During the Wakefield Competition Mr. Schröter, 2nd Captain and the interpreter for the German team, invited me to their national contest, to be held late in August. Since this date was too early for the zigzag journey by which I had planned to

return to London, I did not make any definite promises. However, when I learned that Harry York and several other English chaps were planning the trip, I simply had to go even if it meant extra expenses.

I was the first visitor to arrive at the Borkenberge gliding and flying field where I found Mr. Schröter, now Major Schröter, retired, looking very tall, strong and important in the uniform he was wearing, already waiting for us. After introductions all around he led me to the hangars where the contestants were having their models checked and examined, since this was the best place where all the different designs could be seen together and at the same time learn something about their contest procedure, rules and requirements.

The events were for fuselage models, R.O.G. and R.O.W., rubber and gas-powered. Special events brought out a gas autogiro, which failed to fly as our own, and steam turbine powered model with radio control which also failed to fly. Class A event was for Juniors (under 18 years) who built from official standard designs. Class B for juniors and seniors



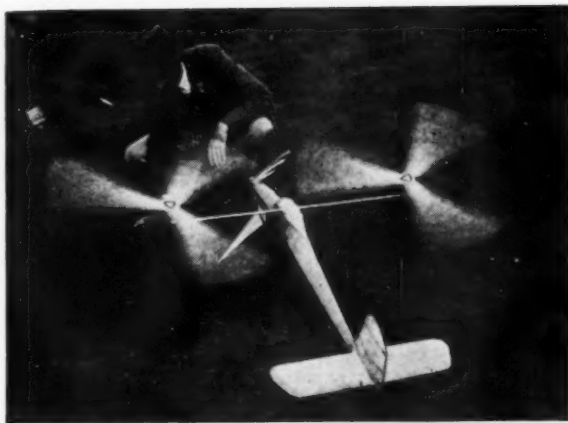
A home-made R.O.W. gas model with a home-made motor that proved reliable.



A unique biplane gas job built by Ernest Bekemeier. Note the large span which absorbs torque.



A scale gas model of a Focke-Wulf "Stosser" training monoplane. The dihedral has been increased slightly.



Here's a practical gas model autogyro which interests Mr. Smith of England. America lags in this classification.



Another unique gas model: a flying wing being prepared for flight by its builder, Hans Adenaw.

for free lance designs, while Class C was for scale models and D for gas-powered. The main restriction was that the model must be made only from materials obtainable in Germany. This ruling seemed out of place to us, but since all had to abide by it, it was quite fair. Actually with our own and Wakefield weight rules stepped up to the present quota, the weight question was about evenly divided, if not in favor of German ships. Also the fuselage cross section area formula seemed to be more lenient, very likely to $(\text{length}/200)^2$.

Spruce and plywood combinations covered with paper or silk, were used mostly in constructing the German models. Although the fuselages were of flat sided design, plywood formers with slots for stringers were used to obtain more rigid construction since mostly casein types of cement are employed. (Celluloid cement is only used for fast repair work since it is liable to peel off from hard wood, especially plywood which has no such pores as balsa.) On wings they used similar built-up, plywood hole lightened ribs and multi spruce strip spars. Some had very neat plywood covered leading edges. (Plywood of .04" can be obtained.)

There is no question that hardwood jobs can be built as light as balsa designs to conform to our rules and be stronger at that. However, it would be difficult to make the model as aerodynamically clean as we can with balsa which can be used generously in having closely spaced ribs, large area covered with sheet balsa, monocoque construction, and still have leeway in using a large power to weight

ratio. But the main handicap is the time required in constructing a hardwood job. I could not help but admire the patience of some of the contestants who did wonders with what they had on hand.

Although this restriction undoubtedly trains many in the art of regular aircraft construction while still in the model stage, the question in my mind is whether it is better for the country in the long run to have a surplus of workers recruited from intelligent ranks or a greater number of men who can "feel the air," learned from constantly building new designs which balsa allows. (Balsa may soon be used, as quite a bit of it is brought into the country as packing material and at the same time a certain amount of capital will be allowed for balsa importation. Heretofore none has been allotted.) In my opinion, if model building is taken up as a means to an end, it is much better to have the boys know as much of the fundamental aerodynamics as the professors in college so that when they get together on formulas there will be a perfect understanding.

If my memory serves me right, there were no metal framework models in the contest itself. Although we did see a good specimen of this construction as shown by the manufacturer of the special pliers which make it possible to bend aluminum or still lighter "electron" to the

(Continued on page 42)



Mr. Haase of the German Wakefield team prepares his model for flight.



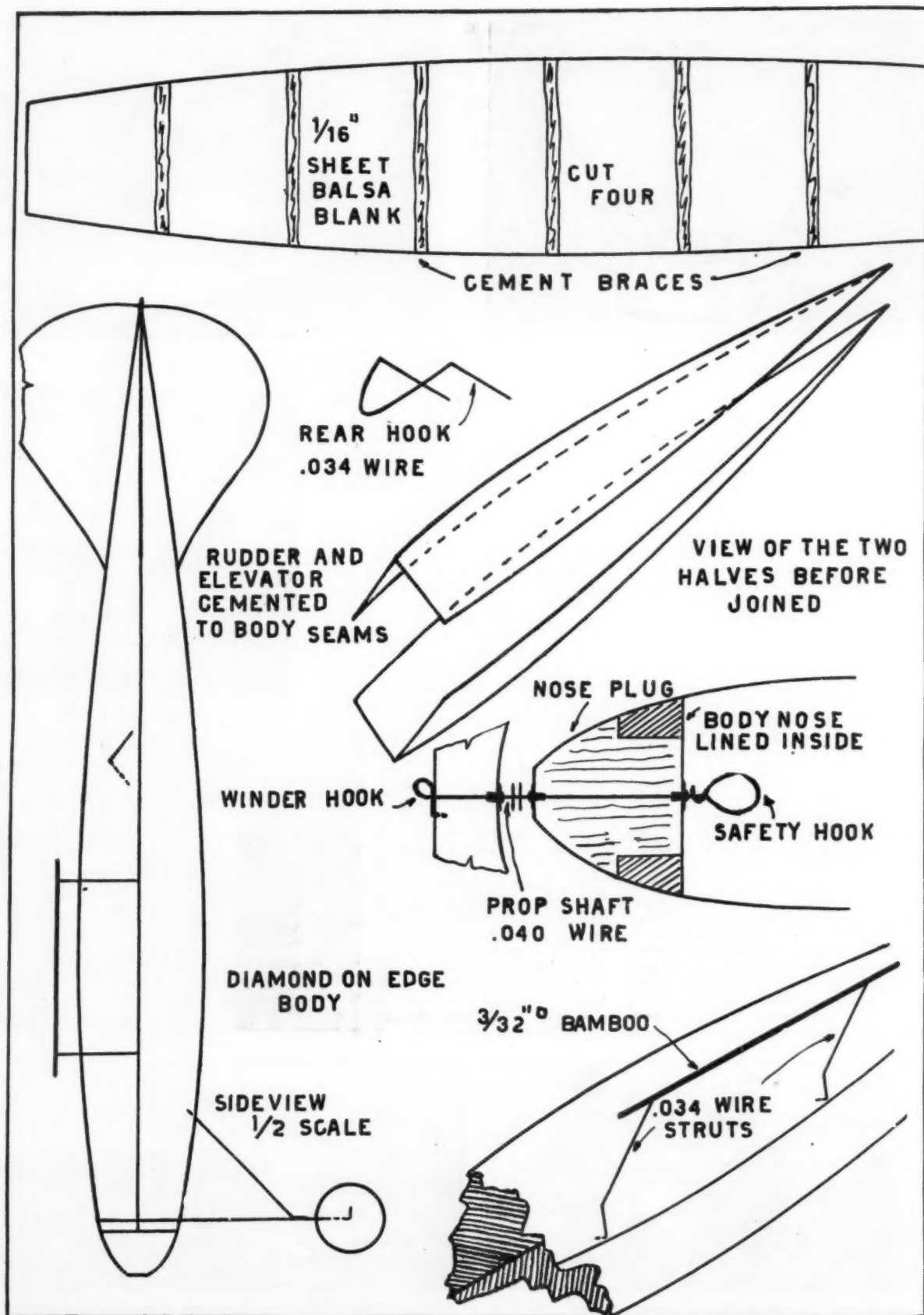
A German contestant and his gas model.

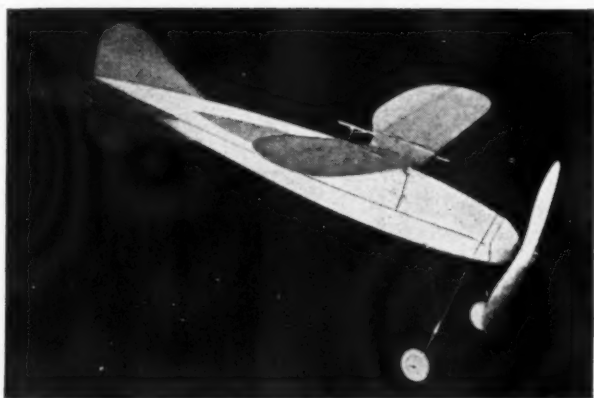


Paul Schroter Jr., son of Major Schroter and group of model fliers with their ships at the contest.



German model builders assembled with their planes on Borkenberge Field, competing for honors in the German "Nationals."





The all-balsa finished model with fuselage of diamond cross section and demountable, adjustable, parasol wings.

How to Build the Arrow Speedster

A Model That Is Very Easy to Build and Which May Be Converted Into Other Types of Planes by Changing the Wings

By LOUIS GARAMI

A SPEED model contest is no doubt the most interesting and exciting event of any model competition. This is easily proven by one look at the size of the mob which gathers quickly at such an occasion, scenting some real fast flying or a lot of juicy crack-ups.

In sharp contrast to the milling crowd outside the ropes the number of contestants is very small; only a few hardy individuals preparing to show their skill at high speed destruction.

Having been present at every contest in and around New York I had the opportunity to question numerous builders about the cause of their staying away from the speed contest. Thus the final analysis gave me a very good idea just what the trouble was.

The average builder thinks that a speed model has to be a gloriously streamlined affair to be able to fly fast. The few plans published so far were not practical nor easy enough to take a stab at by the average builder and when one watches a super streamlined model beat itself to pieces, the conclusion is quickly drawn.

In plain words; not enough fun for too much work. And so the problem was plainly written; requiring a foolproof speed model, as foolproof as any other type, which does not need tricky adjustments, easy to build and will give as much fun as one really expects out of a model.

I have built six different models in the spring of 1937 refining and improving here and there but always keeping the main idea—that is to make it super light. All kinds of bodies were tried before the one used here which tips the scale at .25 oz. and holds 32 strands of $\frac{1}{8}$ " rubber with ease. Every part of the model was a separate experiment until all but the most practical bit the dust.

For a final test, the model was built by several others. The performances of these were so pleasing that within a week eight more entered for an informal contest. The rules of this contest required N.A.A. cross section R.O.G. for 88 feet distance. In a perfectly calm weather the winning time was .9 second while the others tied and bunched up around 1 second.

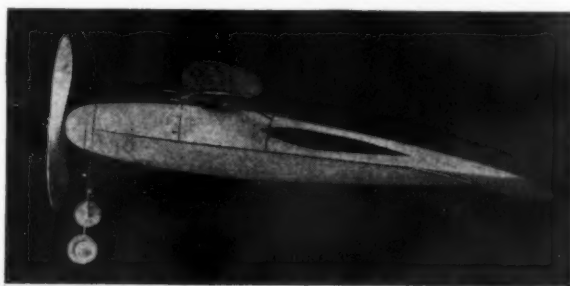
The main features of this model are, the

ease with which it takes off the ground and the perfectly straight course it flies without climbing. In case the builder gets tired of this sort of flying, a built-up wing instead of the balsa one will convert the ship into a sky rocket with a climb of 100 feet in 2 seconds.

Read the construction notes carefully because it contains many valuable hints and information.

Body

In order to get the finished body weighing .25 oz. use the lightest balsa you can lay your hands on. First cut out the four blanks and sandpaper them alike in a bunch secured with pins. Do not distort the outline in the procedure because it may result in a crooked body with wavy seams, putting the tail surfaces out of line. Mark off the lines 1" apart as shown on the plan and proceed to make a nice fat cement mark on each with the glue stick. When the cement marks dry, they sort of cup the body sides and also strengthen them a lot being on the inside of the body. First the two halves are



The plane has sleek lines and is well proportioned for stability at high speeds.

pinned together individually and compared with each other as to the angle they are set at. Then glue is put into the seams from the outside and set aside to dry for about 20 minutes.

To complete the body put the two halves together using plenty of pins; even a strong rubber band to hold the nose from springing apart until the cement takes hold.

Watch the seams of the body during all operations and make sure that they are straight.

Smooth out the whole outside, including the seams, with fine sandpaper and proceed to line the inside of the nose with $\frac{1}{8}$ " sheet

balsa. This lining is unusually long. Its purpose is to hold the nose plug very firm, thus preventing prop oscillation at high speeds.

The nose plug is of hard balsa carved to blend into the shape of the body and coated with cement. Make it fit fairly tight to avoid trouble after a few flights due to a wobbly nose plug.

The rear hook is bent out of piano wire. The .034 size is strong enough to hold 16 strands of $\frac{1}{4}$ " rubber but above this .040 should be used. To put the rear hook into the body, puncture a $\frac{1}{16}$ " hole on each side as shown on $\frac{1}{2}$ " scale side view and wiggle the hook through the hole until both ends are out. Cement several times to a firm joint.

Use hard balsa for the propeller. Do not carve the blades too thin. About $\frac{1}{16}$ " is all right at the tips. Coat the whole prop with cement several times until it gets shiny. The safety hook on the prop shaft is very essential because lubricated rubber has the habit of climbing up and off the hook just when it is wound for a rousing flight.

The landing gear is the conventional wire type. Tie the joints with thread and glue at least twice. Standard hardwood wheels are used with $\frac{1}{16}$ " O.D. aluminum tubing for bearings.

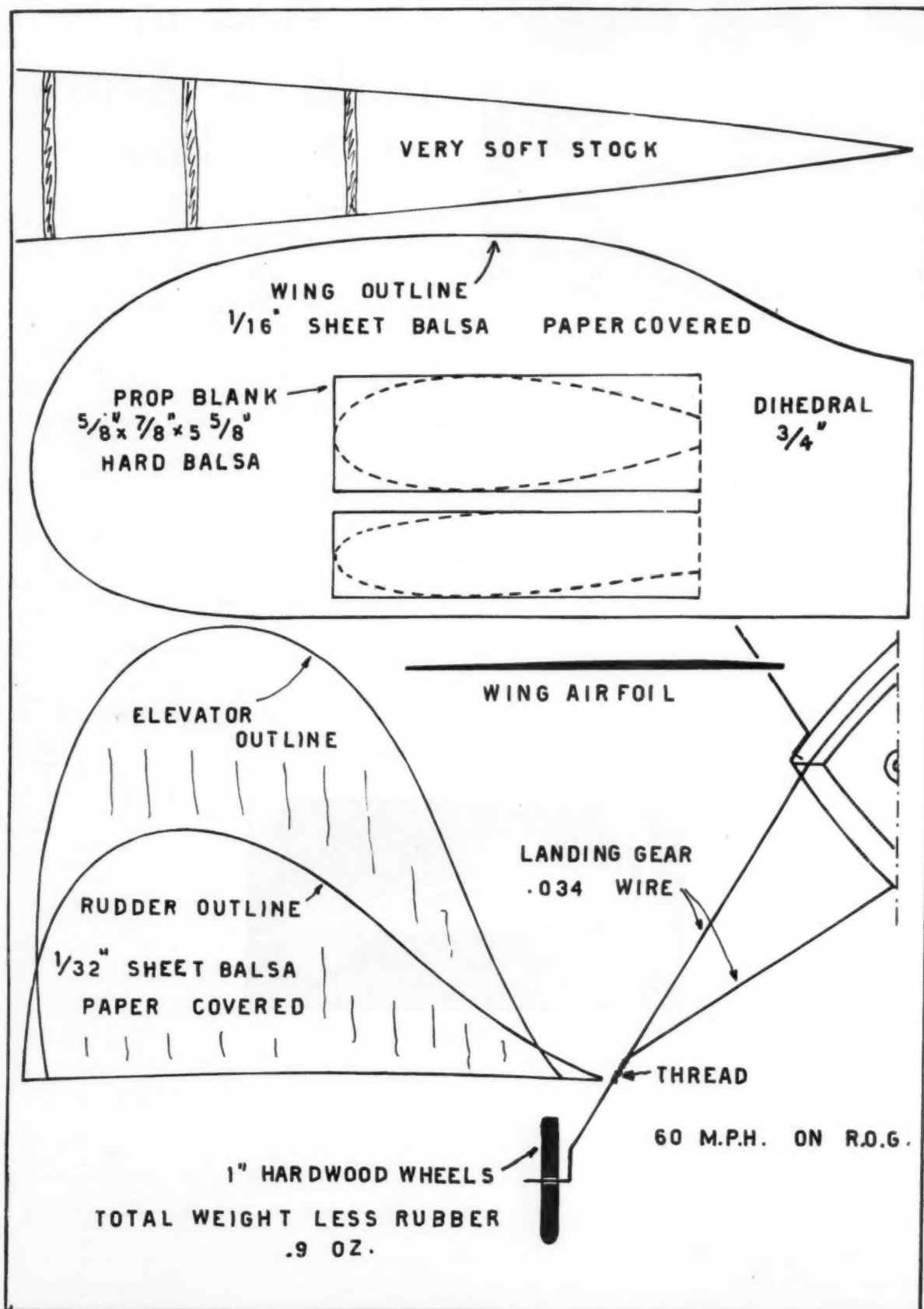
Wing and Tail

All the surfaces are of sheet balsa. Use soft and unwarped stock. Sandpaper smooth and cover both sides with tissue paper and dope over it again. This will prevent the wood from splitting and strengthens the same.

The tail surfaces are glued to the body seams. An occasional check-up in the first hour of drying will assure a permanently lined up job.

The wire wing struts are all the same size placing the wing at no incidence to the thrust line and elevator. In case a slight adjustment is needed simply bend the front or rear struts to get the required results. The wing is held on with two small rubber bands which allow the same to jump clear off the struts in a hard collision.

By means of this arrangement the wing may be replaced by another easily.
(Continued on page 38)



Soaring Flight

Some Observations Resulting From the Soaring Flights of Birds That May Contribute to the Efficiency of Your Model Planes

By L. J. LESH

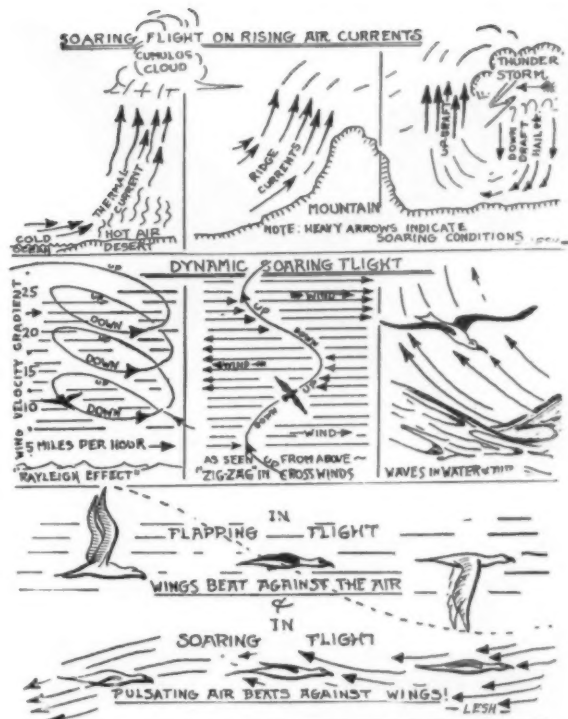
PROBABLY one hundred articles and technical papers, to say nothing of books, have been written on the subject of soaring flight. My excuse for adding one more effort to the list is that I have spent the past year in Florida studying the flight of several varieties of soaring birds and imitating their performance with contest gliders. Among the thousands of model airplane enthusiasts comparatively few have had the opportunity to watch the buzzard, the pelican and the frigate or man-o'-war bird flying in the same air currents and to actually launch balsa gliders in competition with these masters of soaring flight.

Months of observation and waiting are required before a proper comparison may be made of the soaring skill of birds and I have never been satisfied that observations detailed in books and articles written on the subject are sufficiently complete.

There is no question that the soaring flight of the buzzard and the frigate-bird is advanced far beyond any of our attempts with models or full-size sailplanes. The important thing is to ferret out the differ-

ence which exists between the bird and the man-made machine both in design and mode of flight. We know that under certain conditions our balsa contest gliders are capable of staying aloft and of flying completely out of sight. The records of over 30 minutes in the air for hand-launched gliders prove that we have attained an approach to the secret but our egotism, if we have any, receives a jolt when we note that the buzzard remains aloft all day on motionless wings under practically any conditions.

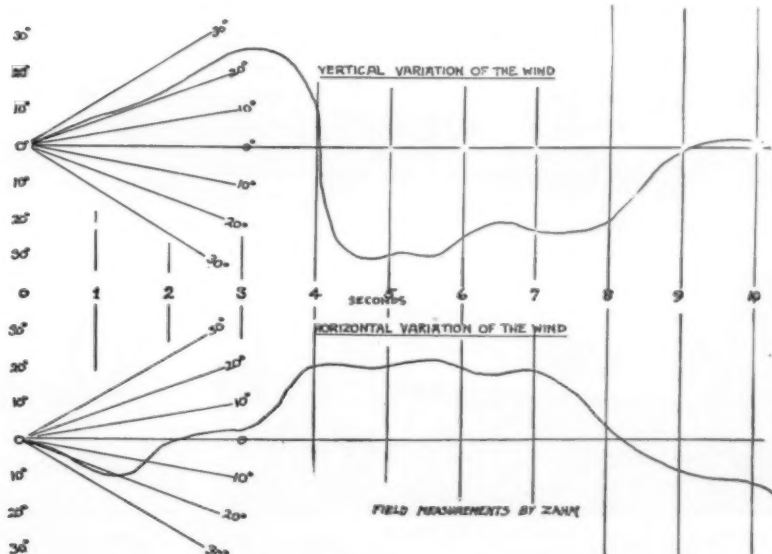
For the purpose of easy reference I have sketched the buzzard, the frigate-bird and the pelican to approximate scale and in three views. These birds are all of about the same wing span, averaging five feet, although larger specimens have been measured. The pelican is by far the heaviest, the buzzard is second in weight and the frigate is light both in poundage and wing loading per square feet. The buzzard and frigate are streamlined dreams but the pelican has a beak like "Schnozzle" Duranty which probably has something to do with the low rating I give him as a soaring bird after much observation.



We also have some very large and long legged cranes here in Florida but their flight is scarcely worthy of serious study. One interesting thing, however, is the way they trail their long legs and web feet behind them, giving the general appearance of a very thin airplane or sailplane fuselage and rudimentary rudder, the affair being evidently used for steering and balancing during their fairly flat glides. These cranes glide slowly, perform flapping flight as slowly as two seconds per stroke and could probably soar if so inclined but nature does not seem to have given them such an assignment.

The pelican, contrary to published state-

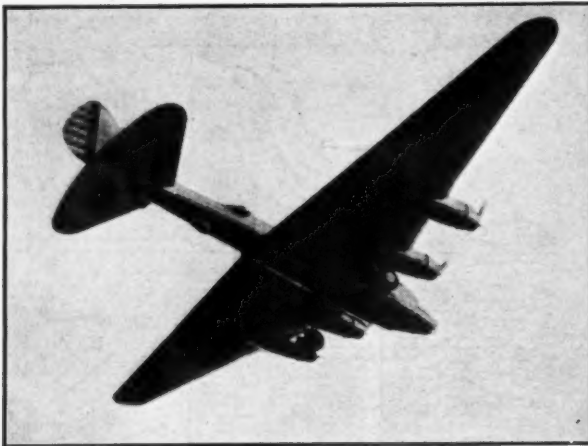
(Continued on page 36)



Frontiers of Aviation

Highlights of the Latest Developments in the Fields of Naval, Military and Commercial Aeronautics—How to Build a Scale Model of the Consolidated Patrol Bomber.

By
ROBERT C. MORRISON



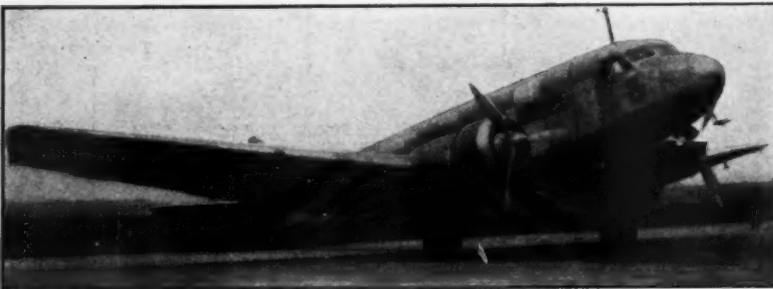
The U.S. Army's largest bomber, the Boeing YB-15 in full flight. It has a spread of more than 150 feet. (Globe)



A sketch of the proposed new Mammoth Boeing 242 m.p.h. transport in flight, to be used on trans-continental routes. (Acme)



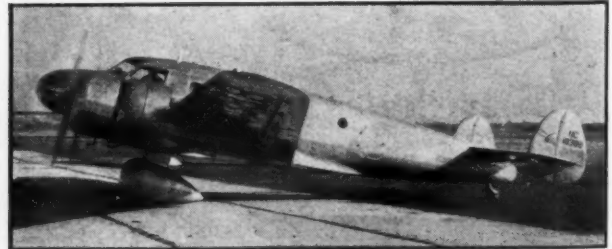
Howard Hughes' round the world Sikorsky. (Shipp)



A 16 passenger 200 m.p.h. transport used on French airlines. (Monkmeyer)



The new Brewster 2 seater mid-wing XSBA-1, built for the U.S. Navy. It has a speed of over 300 m.p.h. (Faber)



The new Barkley-Grow transport. This ship has a rigid landing gear. It has just been granted its N.C. license. (Shipp)

LAST month we gave some details of turbulence and activity of certain individuals and companies in the fight for trans-Atlantic air supremacy. Following is some more invigorating news on the future of the American commercial flying boat and also a smattering of what they are doing abroad to give our Pan American Airways and American Export Airlines some competition.

K.L.M. (Royal Dutch Airlines), a good friend and customer of the Douglas Aircraft Corporation, is reported to have entered the sudden splurge for some of that trans-Atlantic commerce wealth.

The airline has ordered a Scheldemusch long-distance tri-engined monoplane powered by Cyclone "G" engines for Atlantic experiments. Though we have heard nothing about it in this country, abroad there is plenty being said about K.L.M. having submitted an order for some of the new Douglas DC-4s!

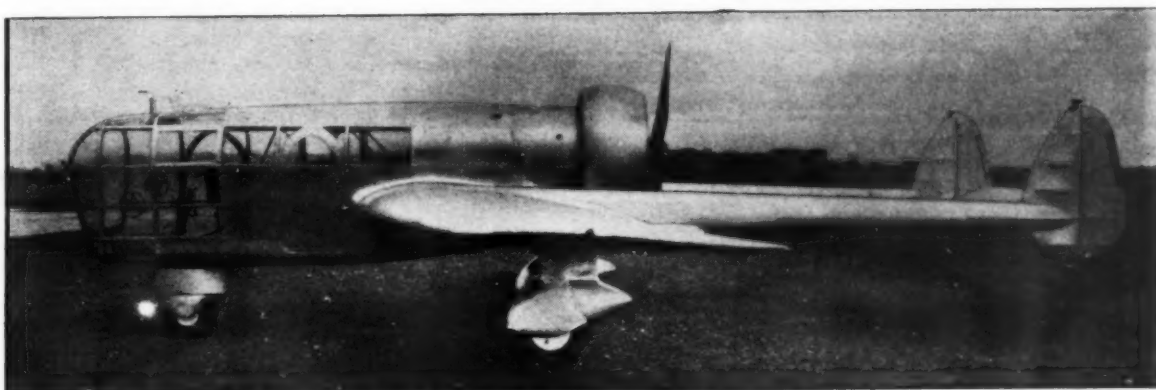
Short Brothers, who built those wonderful Empire flying boats for Imperial Airways, is now well under way with a giant twice their size. Though not of the same huge proportions as those to be built for Pan American Airways in the near future, the new Short boat will keep Imperial Airways well up in the running.

Almost at the same time that Pan American made a call for bids, Air France, the combined French air transport concern, began arrangements to place an order for a whole fleet of 72-ton flying boats so it may also enter the flurry!

It is already known that the Latecoere Company of France contemplates building a giant six-engined flying boat of very clean cut design, carrying a crew of eight, 20 passengers and 3 tons of baggage and mail. It will have a high speed of about 165 m.p.h. Wingspread in 187 ft., 141 ft. in length and 33 ft. in height. A pronounced deck through the wing is also contemplated. The horizontal tail has a pronounced dihedral with twin-rudders at its extreme tips.

Another newly created design is the French Cams 161 flying boat of 37 tons gross weight. Also being a six-engined airplane with 1,100 hp. Hispano-Suiza engines it should have a fine performance. Wing tip floats are retractable into the 130 foot wing.

Thus we see the most recent moves of Dutch, English and French companies, and we already known that in Germany a big eight-engined Dornier flying boat is taking form. The latest German



The new Abrams Strata-plane, designed especially for photographic surveys, with a pusher propeller. (Morrison)

zeppelin will also make its maiden flight very soon to eventually fly the Atlantic.

Many months ago we were the first to mention that Consolidated had a large commercial project on the fire and now we can bring you more of the details. From Consolidated's drafting room came the following specifications of a contemplated flying boat designed for service across the Atlantic and Pacific Oceans.

Gross weight—110,000 lbs.
High speed—(10,000 ft.)—226 m.p.h.
Landing speed—67.7 m.p.h.
Service ceiling—16,600 ft.
Rate of climb—504 ft./sec.
Wing loading—37.8 lbs.
Power loading—22.9 lbs.
Wing area—2911 sq. ft.
Wing span—185 sq. ft.
Weight empty—55,505 lbs.
Useful load—54,495 lbs.
Fuel—6250 gallons.

A total of 54 passengers will be carried with a crew of ten. In appearance the plane is conventional with full cantilever high wing, single rudder and fin, four radial engines perhaps of the 1,500 hp. Cyclone breed and retractable floats. Unlike the wing tip floats on Consolidated's present Navy boats, the floats are well in towards the hull and retract inwards. The bow of the hull is semi-spherical in shape and gives the captain and his crew plenty of room to work in. The remainder of the hull is the usual shape except that the long tail that is aft of the last step is circular in cross section. In this portion the windows are placed low on the sides and thus the passengers can easily look down onto the ocean without having to spread their faces all over the window pane. Passenger accommodations are provided clear to the end of the hull. Like all the new flying boats there will be two

decks for passengers.

Lockheed has been giving the commercial flying boat some consideration lately while Glenn L. Martin, already engrossed in the business, has built a large model which appears to be a two-place twin-engined flying boat at first glance, but it will just be used for experiments in designing its larger offsprings.

The Naval end of the flying boat business has also seen activity of late when Glenn L. Martin received an order for 21 giant patrol bombers to cost \$5,299,538! Thus Consolidated's Navy flying boat monopoly has

been broken. The boats, costing over \$250,000 each, will of course be much larger than the present twin-engined
(Continued on page 47)



The latest air fighter for the U.S. Navy; the Grumman mid-wing. (Globe)



Special Ryan trainers for the Mexican Army. (Conner)



The Heinkel HE-116 four engine transport, to be used on the airlines across the Atlantic to South America.



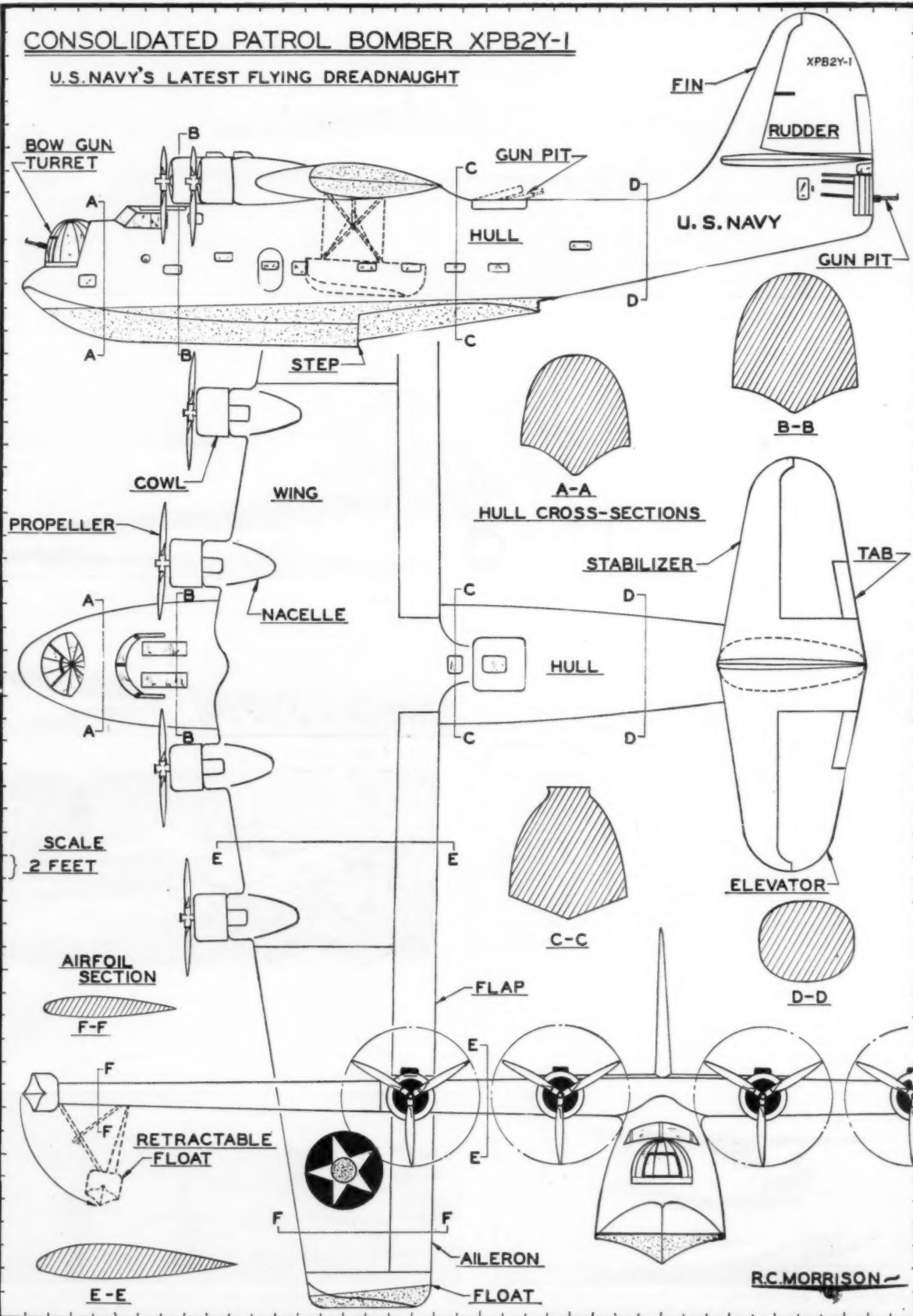
A British Navy seaplane that flies without a pilot. It is controlled from a surface craft by radio. (Acme)



A new Russian light transport that recently set a world's distance record for non-stop flight. (Soyouzphoto)

CONSOLIDATED PATROL BOMBER XPB2Y-1

U.S. NAVY'S LATEST FLYING DREADNAUGHT



By WILLIS L. NYE

"You and Your Job"

Problems That You Must Face As An Employee and How They Should Be Handled in Order That Your Job Will Lead You to Success and Happiness

THE art of association on a pleasant and cordial basis with your co-workers is a talent the value of which but very few individuals can really appreciate. After everything is said and done, business contacts and association should be conducted on a basis of sincerity with an air of friendliness and courtesy. This particular characteristic is always typical of the better class of salaried executives. Undoubtedly this particular ability has been a potent factor in aiding them to attain a position of executive authority. It would be well for the tyro youth who enters the aircraft industry to immediately cultivate this specific manner of conducting his transactions.

The chief individual in a highly departmentalized organization is usually a person who has been chosen for the post by virtue of his experience and executive qualifications. As a general rule, such a person is liberal in his opinions and does not allow personal differences to influence his attitude toward the work. In all fairness, this is sometimes not the case. It is the experience of the writer that opinionated individuals seldom hold executive posts very long. However, the vital interest in any aircraft engineering force is to execute the technical work to the complete satisfaction of everyone concerned for the lowest possible overhead cost.

While some factionalism exists in every organization it is an accepted fact that such cliquing of the employees militates against the efficiency of executing the work on hand. The attitude of "letting George do it" is wrong. This simple fundamental fact concerns all of us at one time or another. Everyone at some time has felt that the other fellow is getting the better deal, the better job, the better income and the better chance for advancing. Such is not always the case if an analysis of the situation can be made on a rational basis. It must always be recalled that wages have to be earned before they can be paid. This should be the credo of every employee who is conscientious and honest toward his employers. An organization is comparable to an airplane structure inasmuch as every individual part must react to the situation with the greatest efficiency. This should apply to each individual in the engineering force, or for that matter, in any branch of the business.

It is quite frequently overheard in conversation among the employees that the "chief" harbors a personal animosity against some particular individual or group. In the average case nothing could be farther from the actual truth. Every employee should realize that after all cooperation is expected regardless of whom one must deal with. The key man in any office is human after all. He is constituted the same as the lesser luminaries. He is subject to their whims, desires and what may be termed "off days." Because the chief of the department occu-

pies a strategic position in the conduct of the execution of the work in progress, his responsibility is the combined responsibility of every subordinate. Naturally, having to bear the brunt of this burden he is in a critical position because he is on middle ground. His inferiors tend to bear upward and his superiors tend to bear down on him. In short, he is the buffer or transition member in the whole pattern of things.

It is obvious that his only recourse is to depend upon the unbiased loyalty of his subordinates to the fullest degree. Conversely, it is to his own advantage to cultivate and inculcate loyalty in his inferiors by his actions, ability and character to merit their confidence in his judgment. His problem in gaining the subordinate's loyalty is one of overcoming each individual inhibition, animosity and character defect of each and every person he must deal with. It is apparent at once that this is no particularly easy task. Therefore, it is up to the individual to aid his immediate superior in every way possible to make his own and his superior's task easy. The easiest way to gain respect from the boss is to respect him. Sooner than you imagine this will react on his subconscious mind. Do not be afraid to do a little personal favor if the opportunity pre-

The important point is to solve the problem and not resort to bickering as to the method of solving, which is minor. After all, experience is the best guide in engineering practice and usually the head of a department has the greatest experience. Therefore his wisdom is to be valued in such matters.

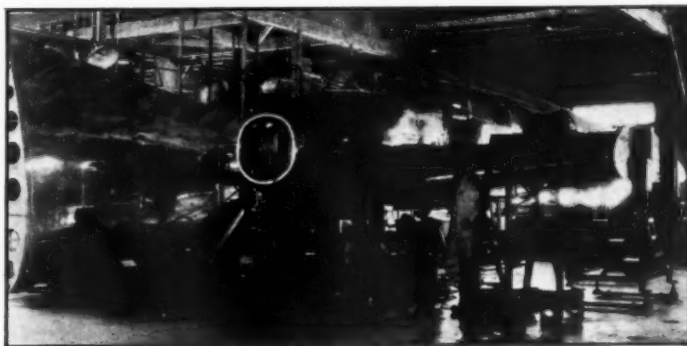
Often making suggestions will be appreciated, but after all, the head man in any department is responsible. His choice of some particular method absolves the subordinate in event his method fails to prove satisfactory in service. On the other hand, if the subordinate makes the suggestion and it is accepted after wrangling, then if the device does not prove satisfactory in service, the person who started the original suggestion is subject to blame either personally or outwardly by his chief. Many lesser employees are enthusiastic to suggest ways and means of making some improvement. Most concerns welcome ideas and suggestions, but they do not feel inclined to make financial compensation for such. If you make some suggestion and the company uses it to advantage, do not feel browbeaten if nothing comes of it in a financial disbursement, but feel that you owe this to the goodness and well being of the

company. It is a good example of industrial reciprocity. If you are a salaried employee, realize that no matter what your previous background and experience, a certain sum has to be expended by the company you work for on you, before you are a productive factor. Certainly the corporation which hires you is entitled to some return on their investment because after all if you leave their employment, you can always use the experience gained in working for them to advantage and financial gain.

Consider these things before you condemn your employer or his employment policies. Realize also that after all the only thing the working man has to sell is his ability and loyalty. If either of these is defective, then that individual is a direct loss to the company. They both go hand in hand.

Among the things that the average individual forgets is the fact that your employer, the management of the company or your own departmental head will be subject to all of the whims which unfortunately affect human nature from time to time. Your own departmental chief is not infallible and can be subject to error as well as anyone else. Learn to appreciate that he has his own specific problems to solve.

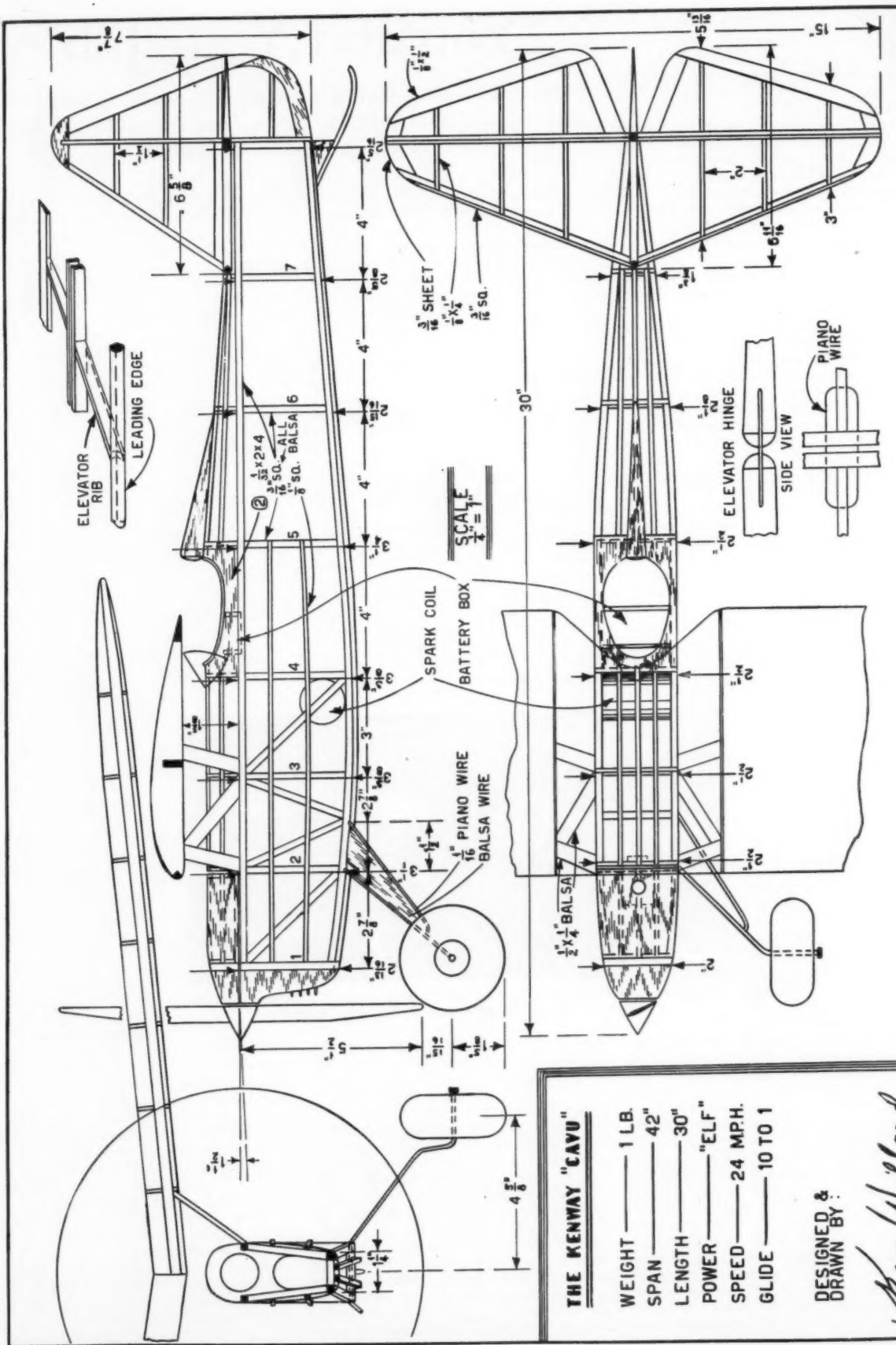
(Continued on page 40)



Workmen assembling the intricate structure of several Lockheed Electra transports. Honest workmanship is the prime requisite.

sents itself. Above all, do not violate the confidence of your superior by discussing things which he imparts to you in confidence. Abide by his decisions and rules. A good rule is to work "with" your boss. If you do not feel like working wholeheartedly, then do not place any obstacle in his progress. He will appreciate that as well.

In all phases of airplane engineering certain technical questions arise in the natural course of design. It is not good policy to abide by a personal opinion in an arbitrary manner regarding some minor point no matter how well it may be taken. Such arbitration slows up the progress of the work no matter what is being undertaken. On final analysis, most engineering problems can be solved in a number of ways.

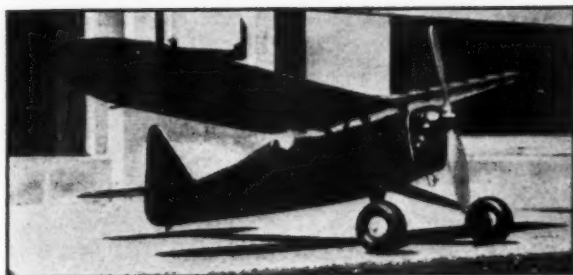


THE KENWAY "CAVU"

WEIGHT — 1 LB.
SPAN — 42"
LENGTH — 30"
POWER — "ELF"
SPEED — 24 MPH.
GLIDE — 10 TO 1

DESIGNED &
DRAWN BY:

Ken Willard



The trim little ship that looks like a racer.



The parasol wing and negative thrust line gives stability.

Building the Midget "Cavu"

AT A TIME when gasoline model design is showing an increasing tendency for complicated structural design, it will be a distinct relief for model builders with little experience, as well as for the expert, to find a model which is above the average in looks and performance, yet is simpler to build than the majority of rubber-powered models now on the market. The "Cavu" (airway abbreviation for ceiling and visibility unlimited) was originally designed with that purpose foremost, and the fact was also taken into consideration that a large number of model builders do not have completely equipped workshops. Only the simplest tools are required in the construction of this model; a razor blade, a pair of pliers and other simple tools being all that are necessary.

Upon completion of the model, any builder will find that he has a model which he may well be proud of, both as to looks and performance. The specifications as given are as accurate as could be determined by actual measurement with a stop-watch. The speed of 24 m.p.h. was reached with the design propeller turning over at approximately 3200 r.p.m.s., and by minor adjustments a speed of 27 m.p.h. can be reached. However, the cruising speed of 24 m.p.h. provides an excellent means for climb and radius of turn.

On its first flight, this model took off from a cinder runway without any aid whatsoever, climbed to a height of 200 feet, flew across the width of the airport, over the hangars and glided to a perfect landing in an adjoining pasture. The total length of the flight was seven minutes, of which two and one-half minutes was engine run. The flight was made at about 7:00 in the evening; obviously there were no thermals to aid the ship in its performance.

Since that time, the ship has completed 53 flights with times ranging from two to fifteen minutes, the length of each flight having been determined beforehand by the amount of gas put in the gas tank. The most gas that has been used to date was half a tank full, or approximately $\frac{1}{8}$ of an ounce, which gave the model a flight of 15 minutes and 42 seconds.

With this performance, and the ease of construction, which will be apparent by studying the drawings, combined with the convenient small size and the fact that it can be carried completely set up and ready to fly in an ordinary car, model builders

How You Can Construct a Small "Convenient" Gas Model That Will Perform Like a Large One

By KEN WILLARD

will find that, for purposes of demonstration or sport, this model is unequalled. Its simple though rugged construction makes minor repairs a matter of only an hour or so, and so far as the author can determine a model that can be seriously damaged only through striking some object head on, or being stepped on. Irregular landings (which incidentally are few and far between) caused by gusts of wind so far have no effect upon the model whatsoever.

In other words, fellows, this model's got everything, so let's get going, and by putting in a couple of hours a day, before you



The little ship gaining altitude and heading for the open spaces.

know it she will be flying right out of your workshop.

Bill of Materials

Fuselage

Longerons, 4 pieces $\frac{1}{8}$ " sq. x 26" long.
Struts, cross braces and diagonals, 3 pieces $\frac{1}{8}$ " sq., 24" long.
Stringers, 8 pieces, $\frac{1}{16}$ " sq., 24" long.
Former material, 1 piece, $\frac{1}{8}$ " x 2" x 24".
Cockpit cover, 2 pieces, 1/32" x 2" x 4".
Engine cowl stringers, 1 piece, $\frac{1}{8}$ " sq. x 12".

Nose block, 1" x 2" x 4".

Headrest, 1 piece, $\frac{3}{4}$ " x $\frac{3}{8}$ " x $\frac{1}{2}$ ".

Windshield, stiff celluloid, 2" x 4" cut to desired shape.
Engine mounts for Elf engine, $\frac{1}{4}$ " x $\frac{3}{8}$ " x $1\frac{1}{2}$ ", 2 pieces hard wood.
Engine mount supports, scrap balsa, $\frac{1}{8}$ ".

Gas tank cradle formed from one piece $\frac{1}{2}$ " x $\frac{3}{8}$ " x $1\frac{1}{8}$ ".

Battery box, $\frac{1}{8}$ " flat stock.

Wing

Wing ribs cut from 3 pieces, $\frac{1}{8}$ " x 2" x 24" flat stock.

Main spar, two pieces, $\frac{1}{8}$ " x $\frac{3}{4}$ " x 24".
Leading edge, 2 pieces, $\frac{1}{8}$ " sq., 24" long.
Trailing edge, 2 pieces, $\frac{1}{4}$ " x $\frac{1}{4}$ " x 16".
Center section trailing edge carved from $\frac{1}{8}$ " flat stock.

Wing tips carved from $\frac{1}{4}$ " flat stock.

Strut braces $\frac{3}{8}$ " x $\frac{1}{2}$ " x $\frac{3}{4}$ ".

Wing struts, 1 piece, $\frac{1}{2}$ " x $\frac{1}{4}$ " x 18".

Wing tip braces, 1 piece, $\frac{1}{8}$ " x $\frac{1}{4}$ " x 6".

Tail Surface

Stabilizer:

Main spar $\frac{1}{8}$ " x $\frac{1}{4}$ " x 15".

Leading edge, 2 pieces, $\frac{1}{8}$ " sq. x 7".

Ribs cut from 1 piece, $\frac{1}{8}$ " x $\frac{1}{4}$ " x 15".

Tips carved from $\frac{1}{8}$ " flat stock.

Elevators:

Main spar, 2 pieces, $\frac{1}{8}$ " x $\frac{1}{4}$ " x $7\frac{1}{2}$ ".

Trailing edge, 2 pieces, $\frac{1}{8}$ " x $\frac{1}{4}$ " x 6".

Ribs cut from 2 pieces $\frac{1}{8}$ " x $\frac{1}{4}$ " x 12".

Tips carved from $\frac{1}{8}$ " flat stock.

Inner trailing edge, 2 pieces $\frac{1}{8}$ " x $\frac{1}{4}$ " x 3".

Hinges cut from soft aluminum.

Rudder:

Main spar $\frac{1}{8}$ " x $\frac{1}{4}$ " x $7\frac{1}{2}$ ".

Leading edge, $\frac{1}{4}$ " sq. x 6".

Trailing edge, 1 piece, $\frac{1}{8}$ " x $\frac{3}{8}$ " x 7".

Tip and bottom former carved from $\frac{1}{8}$ " flat stock.

Ribs cut from 1 piece $\frac{1}{8}$ " x $\frac{1}{4}$ " x 15".

Base rib $\frac{1}{4}$ " sq. x 4".

Landing Gear

Landing gear formed from $\frac{1}{8}$ " spring wire 26" long faired with $\frac{1}{8}$ " soft balsa.

$\frac{3}{4}$ " air wheels.

Tail skid formed from 1/32" spring wire or bamboo with $\frac{1}{8}$ " flat stock balsa support.

Propeller Block

Propeller block $1\frac{1}{4}$ " x $\frac{1}{2}$ " x 11".

Spinner carved from piece 1" x 1" x $\frac{3}{8}$ ".

Miscellaneous

Silk thread for binding landing gear, spark coil and condenser to cross braces.

2 pieces thin aluminum $\frac{1}{4}$ " x $\frac{1}{4}$ " for nose block attachments.

Spaghetti tubing for cockpit edge.

Entire ship covered with Japanese tissue



The author with the finished model. This shows its comparative size.

with three coats of dope, colored to suit, then finished with one thin coat of lacquer. In every case in the above list of materials, sufficient leeway has been allowed for unexpected breakage, and the builder will find that he has more than enough material if he uses reasonable care in construction.

Fuselage

The first step in construction will consist of enlarging the plans to full size. Study the drawings carefully. After the side view has been enlarged to full scale, place a sheet of wax paper over the drawing and pin the longerons in place on the drawing, then cut the struts to fit at the stations as indicated and glue them in place. Next cut the diagonal members to fit and glue them in place. Use plenty of glue to insure maximum strength. After you have finished the one side, lay it aside and allow it to dry completely while building the other side. Upon completion of the second side, leave it in place and cut out seven cross braces $2\frac{1}{2}$ inches long. Lay aside three of them, and, working rapidly, glue four of them upright; one at top of station 2, one at the top of station 5, one at the bottom of station 5 and one at the bottom of station 3. Place a drop of glue on the projecting end of these four cross braces and fit the other side down upon them, aligning the two sides and propping them with bottles or batteries, or any vertical sided object, and allow the glue to dry thoroughly. When it is dry, take the other three cross braces $2\frac{1}{2}$ inches long and glue at the top of stations 3 and 4 and the bottom of station 4. Allow them to dry thoroughly. Next pinch the two sides together at the tail and glue thoroughly, allowing the longerons to assume their own curve, making sure that they are curved equally. Hold the tail together until it dries, either with pins or with binding. Then cut and glue cross braces to fit at stations 6 and 7. Next cut a cross brace $1\frac{1}{2}$ inches long and one 1 inch long for the top and bottom at station 1. The top cross brace will be removed later and the engine will serve as the cross brace. Cut cross braces to fit at the bottom of station 2 and one to cross the fuselage where the rear landing gear wire attaches.

Now cut out the formers and glue formers 2A to 7 inclusive in their respective positions and insert the stringers. Next cover the cockpit section with the proper two pieces and, after they have dried thorough-

ly, cut out the cockpit hole with a sharp razor. Glue the carved pieces to the sides of station 1, as shown in the cowl detail drawing and then glue the side stringers in place. Next cut and bend the landing gear wires to shape. Bind the front wire to the cross brace at station 2 and the rear wire at the cross brace between stations 2 and 3 as shown in the side view. Then cut the balsa fairing to fit between the two wires, bind it in place and then spread glue evenly over the whole landing gear. Now glue the bottom fuselage stringers in place. Shape the tail skid with spring wire or bamboo, as preferred, and glue in place with the balsa support. Carve out the headrest, but do not put in place until the fuselage has been covered later on. Carve the nose block to shape, split in half vertically, hollow to about $\frac{1}{8}$ inch wall thickness, and on each half make the necessary cut-outs for the propeller and engine cylinder as shown in the front view. Incidentally, the drawing shows the grain as running fore and aft, but this should be corrected to run up and down as shown in the front view.

Now cut out formers 1 and 2 and glue the cowl stringers in place as shown in the cowl detail and cover with the $1/32$ of an inch stock; then, as shown in the drawing, cut the top of the nose block off and glue it to the cowl. Cut the hole in the top of the cowl for access to the gas tank when in position, and the cowl is complete. Next cut out and place the gas tank cradle as shown. Then fit the engine mounts, using a beveled joint at station 1 and the diagonal, glue in place and reinforce with flat stock as shown in the cowl detail. This engine mount is for use with the Elf engine, but may be varied slightly to accommodate other engines of similar weight and power. Remove the cross brace at the top of station 1 and place the motor in position. Shape the engine mount blocks and drill them at the forward end to fit the particular motor which is used. Note that in the side view the propeller is shown with a down thrust from a zero stabilizer angle. This down thrust angle as measured from a zero stabilizer setting should be approximately $1\frac{1}{2}$ degrees. It may be accomplished by either placing the engine mounts in at this

angle or by inserting washers between the engine frame and the mounts at the rear mounting holes.

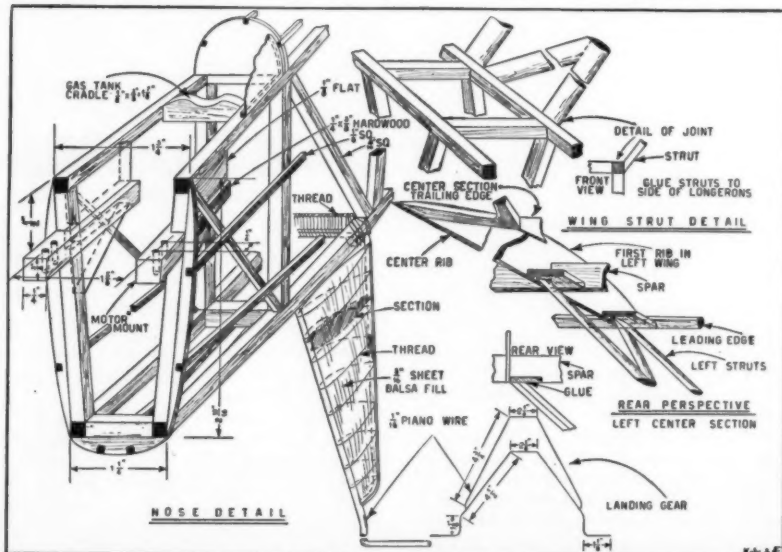
Now build the battery box with the one side closed only by the spring wire as shown, which will press the batteries against the copper sheet at the other side and maintain a good contact. A rubber band will serve to hold the batteries firmly in place while in flight. Solder the wire leads to the spark coil and then place the spark coil as shown and bind to the cross brace at the bottom of station 4. Bind the condenser to the cross brace at the top of station 2 bringing the leads through the former alongside the longerons to the timer. Wire the components of the engine in accordance with the standard wiring diagram as provided by the manufacturer.

Place the lower portion of the nose block in position and glue the small pieces of aluminum provided midway along station 1. Drill a small hole in one end which projects over station 1 and with small screws hold the lower portion of the nose block in place. Glue the spaghetti tubing to the edge of the cockpit, cut out and attach the windshield and the fuselage is ready for covering.

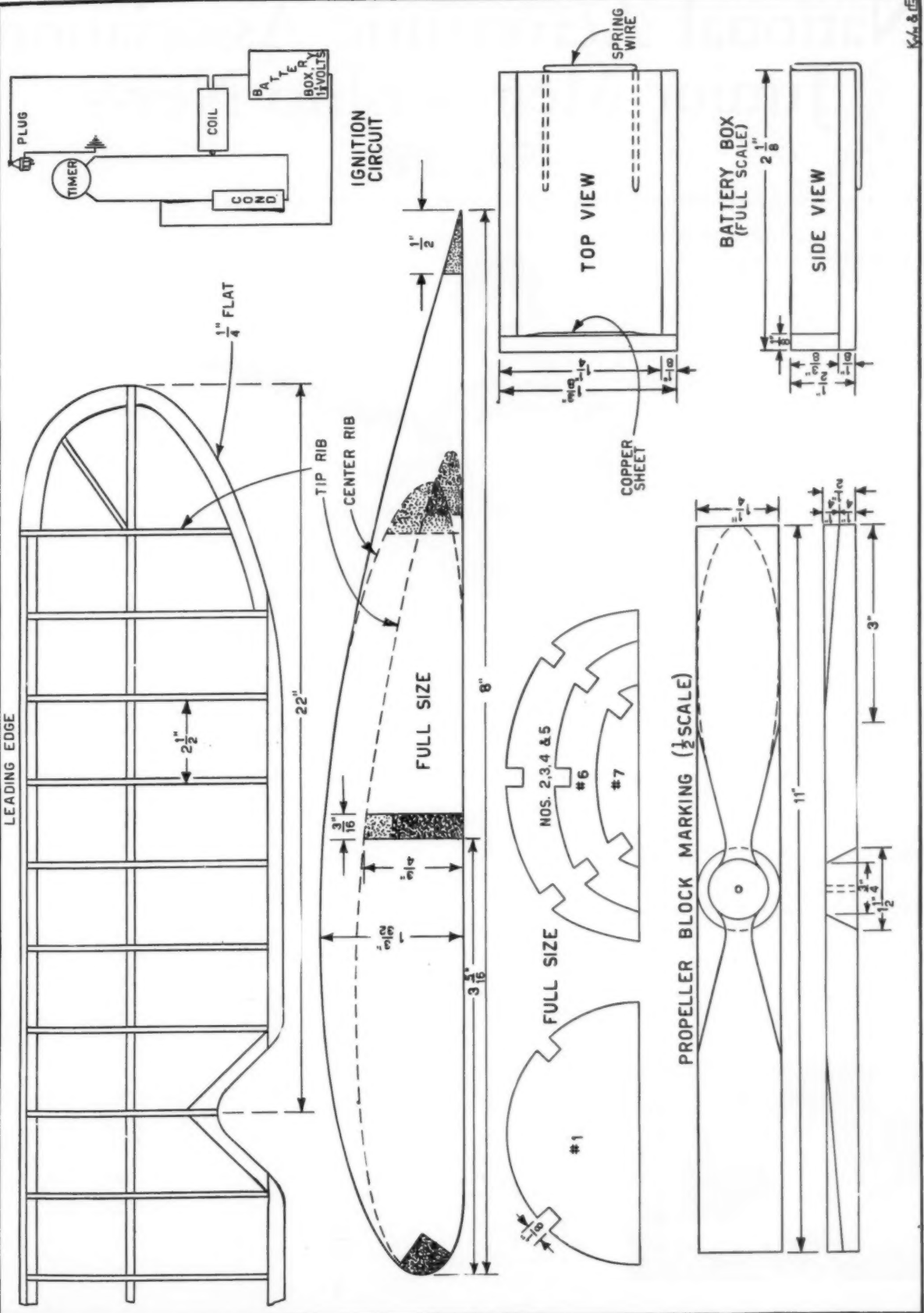
Wing

Although it is not absolutely necessary that the plan view of the wing be enlarged to full scale, unless the builder has already had considerable experience in building wings, it is suggested that the plan be enlarged and the wing be constructed right on the plan. Complete the plan of the left panel to correspond to the right panel and build each panel separately, leaving sufficient length on the spar and leading edge at the center section to overlap and be securely joined later on. Cut out the ribs as shown in the full scale drawing, notching each rib to receive the leading edge and main spar and trimming the trailing end to fit the trailing edge as shown. Cut the spar material to the proper length and mark the rib positions on the spar, then slip the ribs on the spar, aligning them carefully, and glue in place securely. While this is drying, round off and shape one

(Continued on page 38)

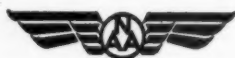


LEADING EDGE



K&E

National Aeronautic Association Junior Membership News



Prepared by National Aeronautic Association, Dupont Circle, Washington, D. C.

New N.A.A. Gas Model Division Gets Going

Headquarters is being deluged by requests for more information on the new Gas Model Division. Don't get us wrong though, it is a very welcome deluge. It proves to us that every gas model builder is really interested in building and flying his models according to rules of safety.

With the fine backing that this new program is getting, it should be no at all until gas model building has established the important place it deserves in the nation's aviation training program.

In many of the letters received at headquarters, there have been questions about forming a Gas Model Chapter of the N.A.A. This is, of course, much more beneficial to the individual than just ordinary membership. Last month we carried the benefits to the individual. Because of the interest evidenced in so many letters, we are listing for you the club benefits.



"Gas Model Clubs are eligible for Charters as a Gas Model Chapter of the N.A.A. The requirements for obtaining such a charter are that at least 10 members of the Club are N.A.A. licensed Gas Model Flyers and that the club has at least one senior advisor who is an N.A.A. Model Director or is qualified for appointment as such. Clubs so chartered receive the following benefits in which all members share:



Leo Weiss in the act of adjusting the tail surfaces of his radio gas job.



Bud Warren of 412 Brett St., Inglewood, Cal., with his 42 inch baby gas job which flew out of sight in two minutes at the contest on Dec. 19th, '37, of the Gas Model Airplane Association of Southern California. Its Warrior engine swings a 10" diam. propeller.

1. A certificate of Charter certifying that the Gas Model Club is an official club of the Gas Model Division of the N.A.A.
2. Official N.A.A. sanction of all meets held by the club. Official certificates for recognition of city-wide championship and state-wide records if established.
3. 3 copies of the N.A.A. Eagle sent the middle of each month contains national model news on records, meets, etc.
4. 2 copies of NATIONAL AERONAUTICS, the official N.A.A. magazine.
5. Upon written request, the N.A.A. Model Meet Kit containing Contest Board Meet badges and windshield stickers, latest model rules and records, timers report forms, etc.
6. The N.A.A. Model Chapter Manual—A 32-page treatise for club officers containing useful information on club operation and activities."

Another matter in which N.A.A. members will be interested is the compensation made to Junior members. If your initial membership fee was paid to the N.A.A. during 1937 and you are still a member in good standing at the time you make application to the N.A.A. for gas model membership, your initial membership fee of 50c is applied toward the gas model membership fee of \$1.00. Hence, you pay only an additional fee of 50c to become a member in good standing of the new Gas Model Division.

Or, if you renewed your membership during 1937 and are still a member in good standing at the time you make application for the gas model membership, that 25c renewal fee is applied to the \$1.00 membership. In this manner, you pay only 75c to become a full-fledged member of the new division.

The N.A.A., in agreement with the I.G.M.A.A., has inaugurated this policy so that those who are already members in good standing of the N.A.A. and are building gas models may become part of the new division without too much of a strain on their pocket-books.

We look to you N.A.A. gas model builders to help

put over the new program so get busy and write us for application blanks, so that you too can assist in the progress of our new division.

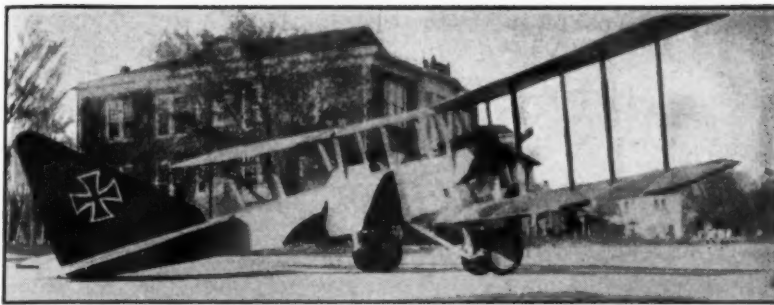
Junior Aviation League Holding Scale Contest

Any Junior Aviation League member of any age may compete in the J.A.L. 1938 Scale Model Contest. There will be two classes of contestants. A Novice Contest will be held for those who never placed higher than fourth in the Junior or Senior division of an annual League scale model contest and an Expert Contest will be held for those who have placed third or higher in either the Junior or Senior division of an annual League scale model contest. League members over twenty-one are to be classed as Expert contestants.



The contest opened on January fifteenth at which time all entry blanks were turned in to Director Munnick properly filled out. The models will be displayed on the model airplane counter on the second floor of the Jordan Marsh Company in Boston on April 16, 1938. Winners will be announced shortly afterwards. The prizes will be awarded at the League's meeting on May 28, 1938. There will be first, second, and third place awards in both the Novice and Expert division.

This should make a most interesting



An 8 ft. Friedrichshafen Bomber built by members of Hangar No. 13, Beloit, Mich.

display and any of you who are interested might pay a visit to the second floor of the Jordan Marsh Company.

Quaker City Model Club Plans Future

The Quaker City Gas Model Association has been laying plans for a very successful year. At the present time they are carrying on a membership drive. They have gotten out a very attractive printed folder giving the benefits of belonging to both the N.A.A. and their Chapter, the Quaker City Gas Model Association. This folder should certainly bring results, judging from the material contained in it.

Plans have been laid too for meets to be held in the future. Mr. William S. Berry, N.A.A. Contest Director for the club, has made application for meets to be held February 12, March 12, and September 10 and 11. All meets will be held at the Northeast Philadelphia Airport under the direction of Mr. Berry. September tenth and eleventh will be an invitation meet at which at least 200 contestants are expected. The other two meets are the regular monthly meets of the Quaker City club, just to keep them in practice.

We are looking forward to a very active year on the part of the various Philadelphia Chapters, and wish them all the success in the world.

F. E. Bachhuber Appointed Director

Basically responsible for the formation of the Wausau, Wisconsin, Chapter of the N.A.A., Mr. Bachhuber has not let his interest wane.

A short time ago an application was received at N.A.A. headquarters requesting that Mr. Bachhuber be made a Contest Director. This request was seconded by William E. Hoffmann, Scout Executive, in Wausau. The recommendations were such fine ones that it is a great pleasure for the N.A.A. to add Mr. Bachhuber to the list of its officials in the model field.

With such a good man at the helm, the Wausau Chapter has fine chances of becoming a very active and successful model club.

Sanctioned Model Meets Held

An inter-city gas model meet was held in Baton Rouge, Louisiana, sponsored by that Chapter. Claud L. Holloway, with his 4½ pound Inspirer, took first place with a time of 6 minutes and 8½ seconds. In second place was Wesley Powell who

made a 3 minute and 15 second flight with his 4 pound Denny, Jr. Robert Bassnett took third with a 3½ pound Quaker Flash model with a time of 1 minute and 37

Hewitt Phillips, Sr.	Indoor	Class C	Stick, Hand-launched.....	9:42.0
Sanford Oringer, Sr.	Indoor	Class B	Stick, Hand-launched.....	6:36.2
Ralph Brown, Jr.	Indoor	Class B	Fuselage, R.O.G.....	6:12.5
Gordon Cain, Sr.	Indoor	Class B	Fuselage, R.O.G.....	5:39.9
Sydney Wallerstein, Sr.	Indoor	Class C	Fuselage, R.O.G.....	4:41.5
Ralph Brown, Jr.	Indoor	Class B	Stick, R.O.W.....	3:15.7
Robert Sebring, Sr.	Indoor	Class B	Stick, R.O.W.....	2:26.7
Ralph Brown, Jr.	Indoor	Class B	Fuselage, R.O.W.....	2:02.2
Sydney Wallerstein, Sr.	Indoor	Class B	Fuselage, R.O.W.....	1:39.1
Willis Brown, Open	Indoor	Class -	Helicopter	1:29.2
Maurice Saidel, Jr.	Indoor	Class -	Helicopter	1:39.3



A Fokker D-7 scale model built by Arnold Huns, Decatur, Ill.

seconds. This meet was held under the direction of Lieutenant J. P. Fraim, Jr., an N.A.A. model director and a well-known figure at the Louisiana State University.

The inter-club meet held by the Junior Aviation League under N.A.A. sanction had the following first place results, as reported to us by Gunnar Munnick, N.A.A. Contest Director:

The above should give you a rough idea of just how proficient the Junior Aviation League members are. This is a report of one of their monthly meets, in which all club members take part.

T.A.M.B.E.

"The Airplane Model Builders Exchange, more commonly known as T.A.M.B.E., was organized in the Summer of 1932. Mr. David Lynn, the adult director and preceptor, brought together eight boys in the Borough Park section of Brooklyn, whose common interest was a keen and eager enthusiasm for creating

model aircraft. The membership rapidly expanded into a group of 35 experienced model builders ranging in age from 13 to 36, whose skill at the art and science developed to a remarkable degree.

T.A.M.B.E. was organized for the exchange of ideas in constructing model planes and the mutual study of theoretical phases of the subject. Common endeavors produced lasting friendships.

The second T.A.M.B.E. club was organized by Mr. Lynn in 1934 in the Flatbush section of Brooklyn, and under his guidance rapidly expanded into a group of active and eager model airplane builders.

(Continued on page 50)

Fill in the coupon below for membership in the N.A.A.

Use this coupon for either junior membership application or for requesting NAA Junior Chapter information.

NATIONAL AERONAUTIC ASSOCIATION OF U.S.A. Dupont Circle, Washington, D.C.

☐ Please send me information on how to form an NAA Junior Chapter and a Chapter charter application form. I enclose a 3c stamp for return postage.
☐ I enclose fifty cents for annual NAA Junior membership dues (use cash, check or money order) and hereby make application for Junior membership in the National Aeronautic Association. (Age limit 21 years).

Name (Please print or type)

Street

City State

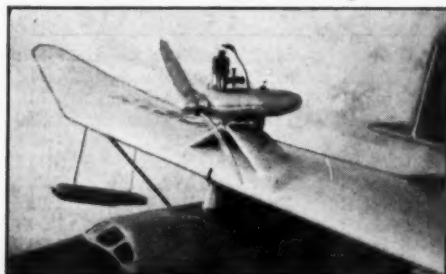
Date of Birth..... (Month, Day, Year)

Membership application approved*.....

* (If membership application is being made and applicant is under eighteen, have parent sign here.)



Pict. No. 1. Reginald Denny and the radio-controlled gas model that Mr. Whittier and he built to be used as a target for the U. S. Army Artillery units.



Pict. No. 2. H. Ramsey's Sikorsky Flying Boat.



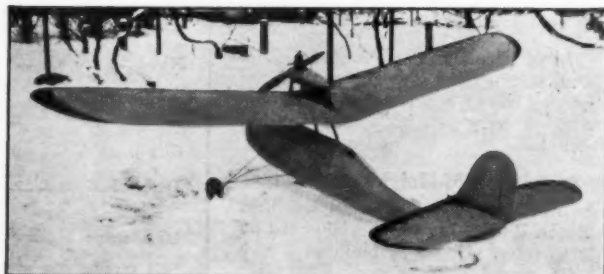
Pict. No. 3. A five pound framework of a KG, by Ronald Scholze. He has cut down on the parts' size to save weight.



Pict. No. 4. A model that flies in England, by E. Underwood.



Pict. No. 5. Gerald Obschleger and his beautifully finished Cavalier. It has made many outstanding flights.



Pict. No. 6. This unusual motor mounting flies this model very well though it weighs 7 lbs. By Gerard Rauch.

"Gas Lines"

Official Section of the National
Aeronautic Association Gas
Model Division

Formerly the I.G.M.A.A.



Gas
Model
Pioneers
Emblem

THERE has been a report from National Aeronautic Association headquarters that the enrollment of old I.G.M.A.A. members in the new Gas Model Division is progressing nicely. However, a large percentage of the I.G.M.A.A. members have not enrolled. We wish to call to your attention the fact that unless you enroll before April 1st, these members will not hold their standing in the N.A.A. as pioneer members. All members of the old Association should not overlook this fact and neglect enrolling before this date, inasmuch as the old I.G.M.A.A. organization will not be carried on independently of the N.A.A., as it was prior to January 1st, 1938.

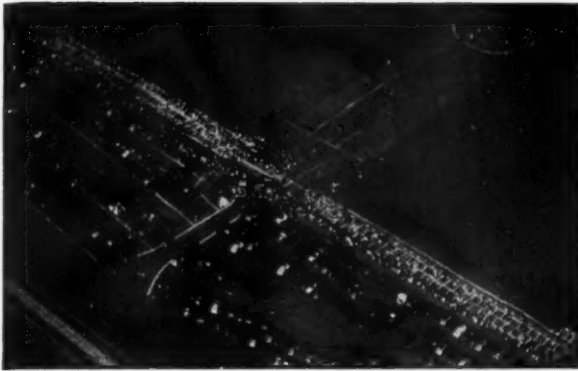
Do not forget that it is a distinctive honor to be classified as a pioneer in the gas model field. After April 1st it will be impossible to attain this recognition by the national organization.

A number of model builders have written in to us objecting to the restrictions placed upon them by the flying rules. First, we wish to call your attention to the reason why these rules were inaugurated.

In many localities

gas model flying was beginning to receive a "black eye," so to speak. Attention was being called to it by numerous people who took it upon themselves to act as "saviors" in the situation. The whole status of flying was reaching a stage where regulation of some kind would be imposed upon it by government officials. This would have prevented gas model flying or curtailed it to such an extent that the gas model builder would eventually have gone out of existence in a practical sense. Inasmuch as many of these government officials had no understanding of the art, it is far better, under these conditions, that the national body which governs aeronautical activity should regulate gas model flying. However very definite rules which would meet the favor of state and other governmental officials were necessary. The rules which have been presented in the membership pledge have been evolved, and these have proved to be satisfactory to governmental and state departments.

In other words, it is better to fly under these rules than have flying stopped entirely in many localities. However, this is not the end of the story. There are many factors about these rules which will undoubtedly be changed. Rules will not be established in an arbitrary fashion regardless of the desires of gas model builders. As soon as the organization gets under way and begins to function smoothly gas model builders will be invited to get together and establish a new set of rules and change the present set so that they will be more satisfactory for gas models. In fact these rules may be con-



Pict. No. 9. An aerial view of the Dec. 19th contest at Los Angeles conducted by the Gas Model Airplane Assoc. of So. Calif.



Pict. No. 10. A 36-inch gas model with its midget engine. This plane placed 11th against larger ships at the Los Angeles Meet.

sidered as temporary until further thought and action can be given to them.

One of the chief objections is the age limit of sixteen. Steps are now being taken so that it will not be necessary for younger boys to give up their gas model activities. It has been suggested that the rules be changed so that those under sixteen may fly under the guidance of a member of the N.A.A. Gas Model Division of sixteen years or older. Considerable thought also is being given to wing loading and weight rules. On March 12th and 13th a meeting of prominent leaders and builders in the gas model field will take place at N.A.A. headquarters, Washington, D.C. Many of these questions will be threshed out at that time. All leaders who can possibly attend should be on hand.

Mr. Grant, the director of the old I.G.M.A.A., wishes to state that at all times he will work for a condition which will allow a true expression of the will of model builders and one in which this will shall become as effective as possible. Domination rather than leadership by officials will be discouraged by him.

We have some very interesting news of activities this month. One of the outstanding events is the production of a radio control gas model by Mr. Reginald Denny of 5751 Hollywood Boulevard, Hollywood, California, which is to be used as an artillery target for the United States Army. At the time of writing it has been planned that a unit of the Sixty-third Coast Artillery, under the command of Lieut.-Col. Claude M. Thiele will go to Muroc Dry Lake and test its marksmanship against this radio-controlled model plane. If the tests are successful they will open the way for general use of such machines to train anti-aircraft and coast artillerymen. It required two years

for Mr. Denny to develop this model before it was possible to build a delicate radio mechanism which permits the control of the craft when aloft. The plane has a twelve foot wing spread and is powered with a three horsepower engine.

In the fuselage of the plane is a three-tube receiving set which relays impulses to tiny electric motors. These operate the rudder and elevators. The ground equipment consists of a short wave sending set and a control box with contact points which modulate the wavelengths of the radio impulses. These guide the model in its flight.

Mr. Paul Whittier, who has been cooperating with Mr. Denny, served as chief engineer of the project since its inception in 1935. Test flights indicate that the Whittier-Denny model will travel sixty miles per hour. The engine will drive its forty-two pounds of weight to an altitude of 9,000 feet, far enough to put the plane out of sight of the naked eye. The speed-size ratio of the plane corresponds exactly to full size ships.

Picture No. 1 shows Mr. Denny standing in front of this remarkable craft. The two cylinder engine is visible. Model builders will note with interest that the size of the propeller is considerably larger than the average one used on gas model planes. The smaller gas model used for ordinary flights may be seen on the ground at the right.

Mr. Harold W. Ramsey of 26 Windsor Street, Worcester, Mass., gives us information concerning a very interesting project which he has recently completed.



Pict. No. 11. Here's a Curtiss Robin hydro that has turned in fine flights. Built by Donald Kilpatrick of Ontario.



Pict. No. 12. Our old friend, Maxwell Bassett, with his latest gas model, a 46 inch.

It is a scale gas model of the Sikorsky Flying Boat, and is shown in picture No. 2. The span of the ship is eight feet. One of its interesting features is the manner in which the motor is mounted. The motor mounting is of original design and consists of a soft pine triangle on which

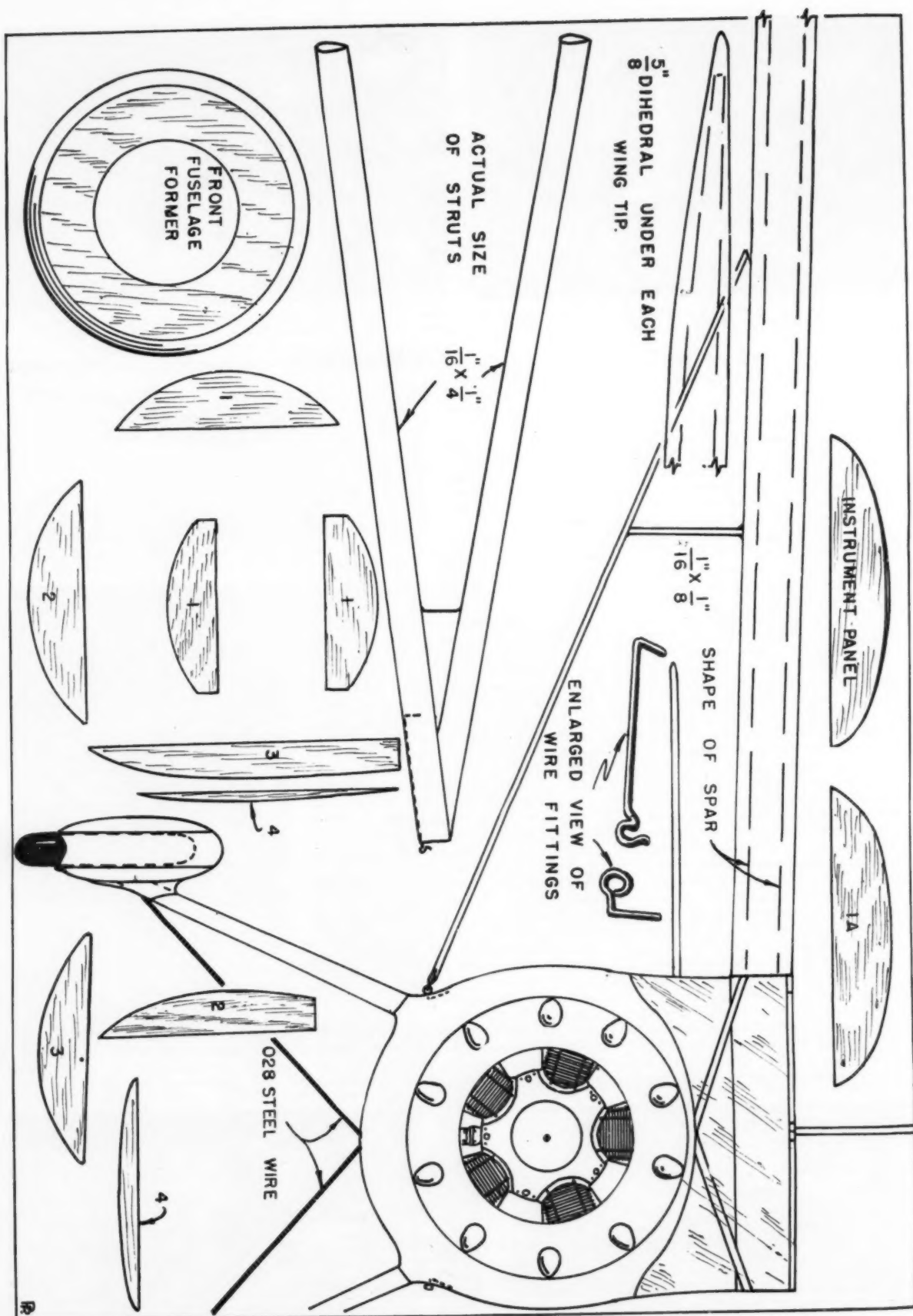
(Continued on page 57)

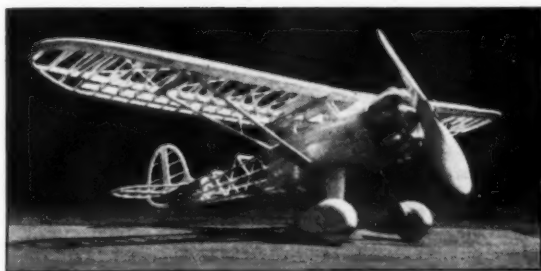


Pict. No. 7. Robert Strader and his Nimbus gas model.



Pict. No. 8. Members of the active "gas" club at Albuquerque, N.M.





The frame embodies the details of the large plane.



Here the little ship displays its realism.

Build and Fly This Miniature Monocoupe

Here Is a Super-detail Model That Is a Fine Flier As Well As a Real Miniature of a Well Known Airplane

By ROGER J. HAMMER

THE 1937 edition of the Monocoupe 90-A is the ship featured this month. The model is a faithful reproduction of the original and is true to scale in as many respects as possible. The Monocoupe is a clean cut sport plane employing highly streamlined struts, generous fillets and wheel pants. A novel striping job combined with a hand-rubbed finish gives the Monocoupe a truly beautiful appearance. Employing a 90 h.p. Lambert R-266, the top speed is 130 m.p.h. with a cruising speed of 112 m.p.h. The climb is 900 feet per minute and the average fuel consumption is 27 miles to the gallon. The Monocoupe has made an enviable record among sport planes in years past and is remembered as a record holder in many light-plane competitions held at various airports throughout the country.

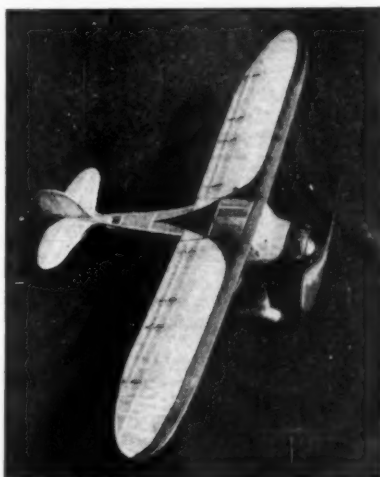
If a detailed flying scale model is desired, the plans should be followed exactly as shown, but those wanting a model with greater "flyability" should make a few necessary changes. These changes would be; less wing ribs (half the amount shown would be sufficient), larger stabilizer and omission of details such as movable flaps, ailerons, etc. The color scheme does not detract much from the flying qualities, but it may be left out if a "super light" job is desired.

Now that you have made up your mind as to which type of model you want to build, familiarize yourself with all the details in the plans and start building.

Fuselage

The fuselage sides are constructed first, the longerons being $\frac{3}{8}$ " square medium balsa. After sticking in pins along the longerons to make them coincide with the curves shown on the drawing, cement the uprights and diagonals in place. Proceed with some other work while the fuselage sides are drying. After the sides have thoroughly dried, cut the braces shown in the top view to the correct size. The two sides may be jigged up now and the cross braces cemented in. Let the fuselage dry,

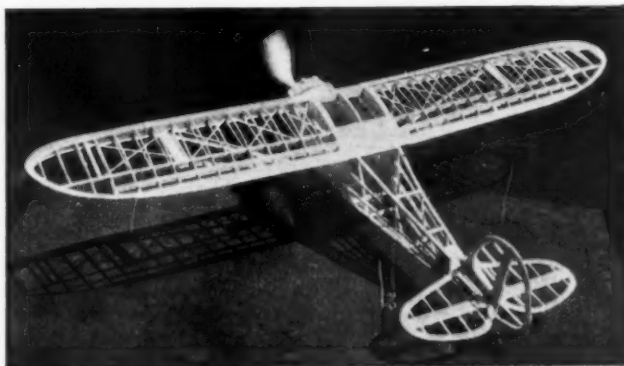
and during the time that elapses, the propeller may be carved. The side and bottom formers should be cemented on next and the planking of the front portion should be started. Although this part of the work is tedious, the result obtained is well worth the additional care. Sand the planking with rough sandpaper and when it has reached a thickness of approximately $\frac{1}{32}$ " it may be finished off with very fine sandpaper and doped. In doping,



It is well proportioned.

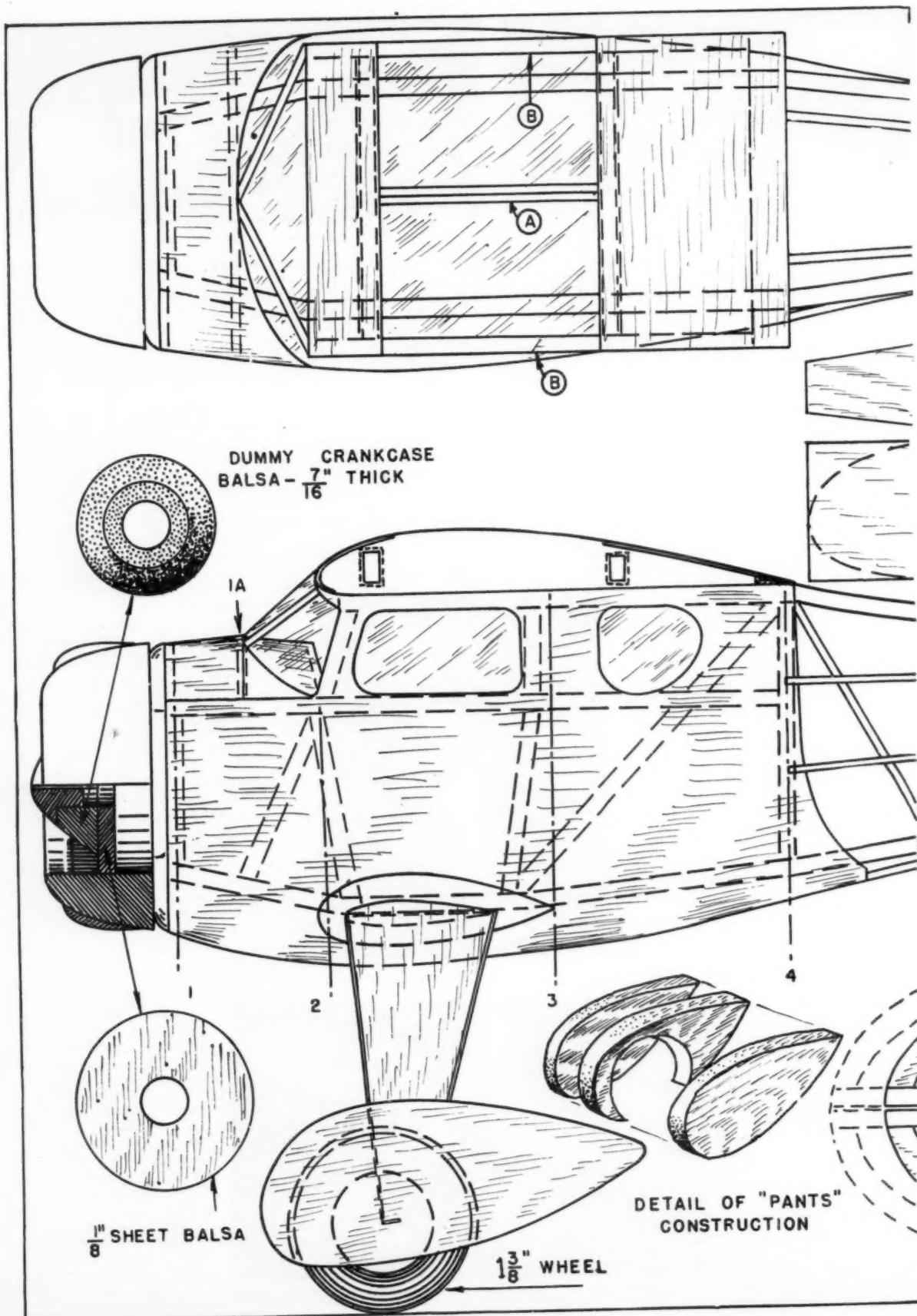
add two or three drops of castor oil to the dope so that it will be more flexible. This will keep the dope from shrinking excessively and warping the thin planking. Form the landing gear struts and insert them in the fuselage. The sheet balsa may be inserted now and cemented in place securely. Refer to the detail in the drawing when doing this. The construction of the pants is simple, so we will not go into detail. However, when cementing them in place take care to see that they line up correctly. If you make your own wheels, don't forget to insert small brass bushings into them for smoother turning and greater wear.

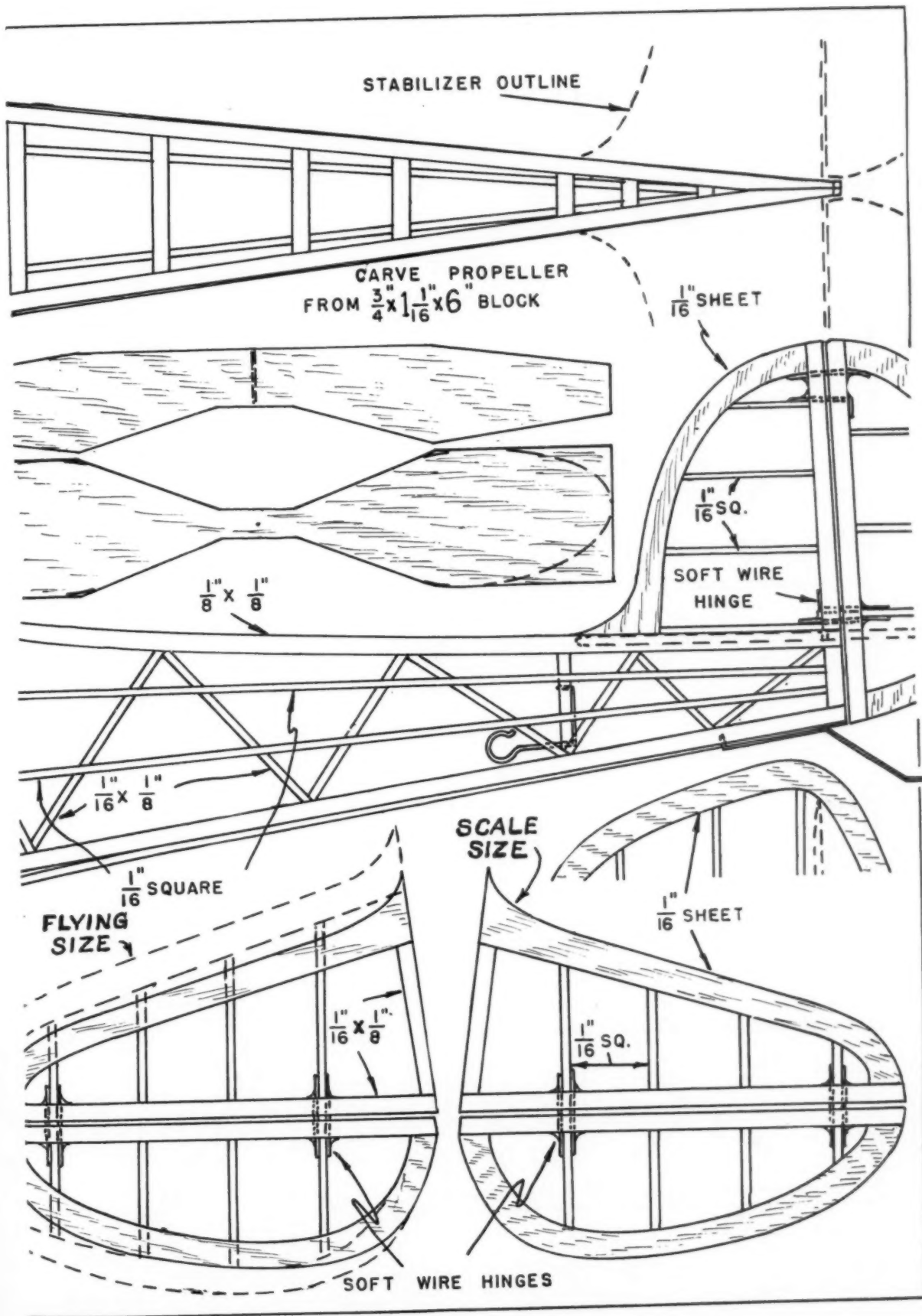
The cowl, crankcase and front plug may be formed by hand quite accurately, but the exacting modeller will turn them on a wood-turning lathe (that is, if he has access to one). Most modellers will have access to a small electric motor and they will be able to do work just as good as any done on a lathe. Cement a small block of wood onto the pulley of the motor, and when it has dried enough, start the motor. Take a small sanding block with rough sandpaper on it and hold against the whirling block. After a little practice you will be able to turn out accurate wheels and cowlings in a short time. Now that you have acquired the knack of making these parts, you may proceed and make yourself a cowl that any modeller would be proud to own. Since you have already made the propeller, bend the rear hook and shaft to shape and cement in place. Now that your fuselage is nearly complete, add all the detail you may want. The cowl bumps are shaped from small scraps of wood and are cemented onto the cowl at the proper intervals. A good mixture for making fillets for the landing gear can be made by mixing equal parts of fine sawdust and cement. After thoroughly mixing, apply the mixture with your finger and mould it to

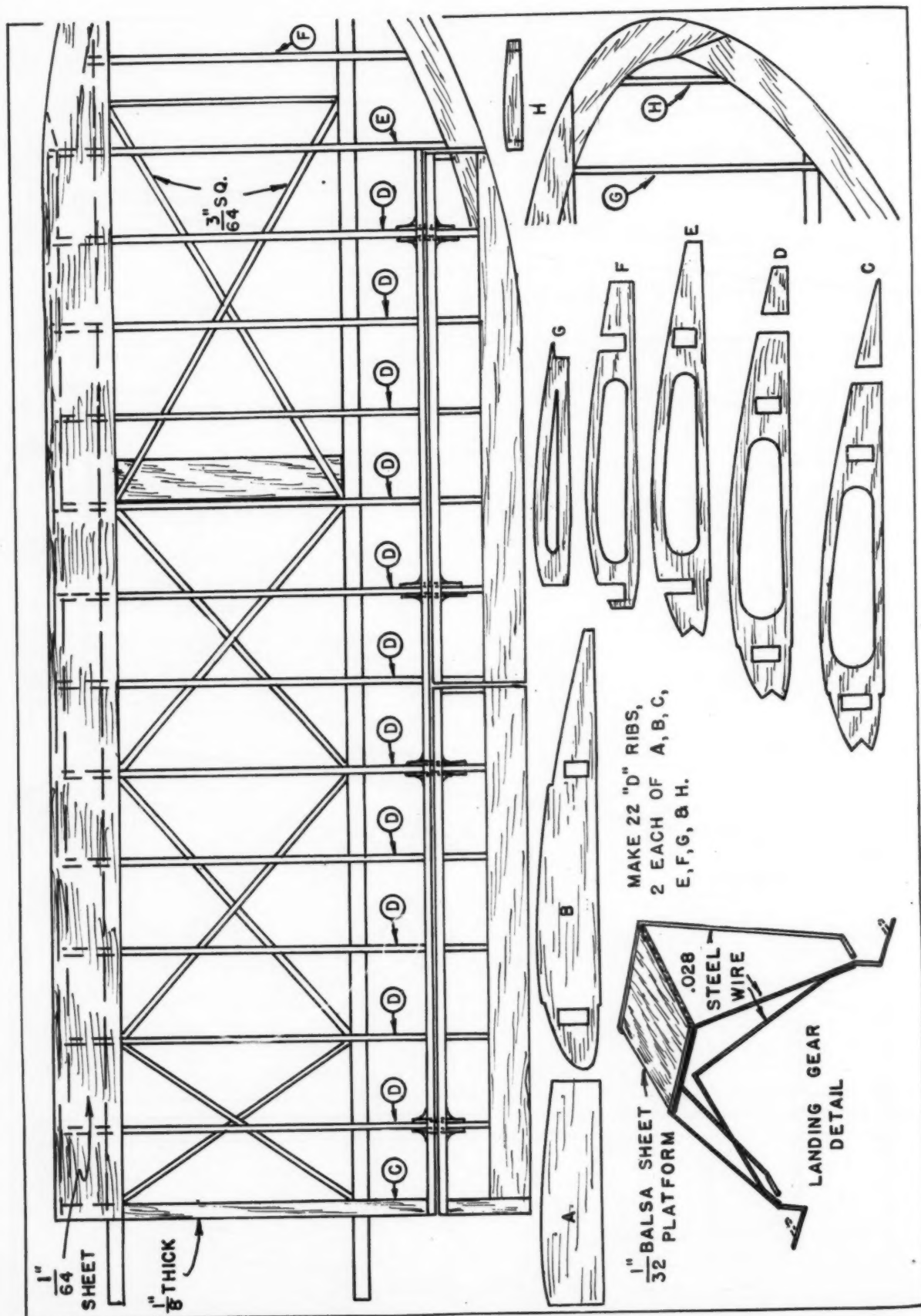


The wing construction is worthy of a real model builder. If you desire it, the stabilizer may be enlarged.

(Continued on page 47)







How Big Shall My Gas Model Be?

Article No. 73
Chapter No. 5

By CHARLES HAMPSON
GRANT

HAVING established the proportions of the span in relation to the tail moment arm of our gas model, the span being 30 inches when the moment arm is 12 inches, the next step is to select the power plant that is to drive it. This must be done before the most efficient size of the model and the tail surfaces can be determined accurately. The performance of the model will depend on its size relative to the power employed, while the relative size of the propeller and the span of the wings has a bearing upon the area to be used in the tail surfaces.

In this respect a gas model differs from a rubber powered model, for in the latter type the performance depends upon the correct design of the propeller which is governed by the wing span primarily and not by the power to be used. The power on a rubber model may be varied to suit the propeller design by increasing or reducing the amount of rubber in the motor, while in the case of a gas model the power is fixed and constant, depending upon the normal power output of the motor. Thus the propeller must be designed for the motor to be used. Then the size of the model may be established which will provide the type and quality of performance desired, according to the laws existing between power, wing area and the weight of the plane.

Selection of Power Plant

The choice of a motor for your model depends usually on four things; price, power output, reliability of performance and the size of the model you wish to build.

The price should not influence you in your choice. As a rule you get exactly what you pay for. The best motor is the one you should select, for by so doing you will be spared hours of fussing with it while trying to get it to run. You should remember that a well made motor that will run consistently cannot be made cheaply. The better the quality of the material and the finer the workmanship put into a motor, the greater will be the cost of producing it. This affects the price for which it is sold.

The power output of a motor determines the limits of size of the model in which it should be used. The majority of the power plants on the market develop about 1/5 horsepower at 4,000 revolutions per minute. Some are very small, generating as little as 1/20 hp. as their normal output. Other motors range in power from 1/3 hp. to 1 hp.

As a rule the larger the power plant is, the less it will weigh for the amount of power it develops. This is due largely to the fact that the size of coils and batteries cannot be reduced below certain limits of capacity and weight even though the motor with which they are to be used may be

How to Choose the Proper Amount of Wing Area for the Power Employed in Order to Insure the Greatest Duration of Flight

extremely small, if reliability and ease of starting is to be considered. A 1/3 hp.

motor will function with the same coil and batteries used in the operation of a 1/5 hp. engine.

The reliability of a motor usually increases with its size also. This is due largely to the fact that clearances do not have to be so carefully considered. A variation in clearance between piston and cylinder walls has not nearly as large an effect on a large motor as on the functioning of a small one, because the piston displacement relative to the circumference of the piston increases with the size of the motor.

However the larger the motor used the larger and heavier your plane will have to be built in order to carry it. As far as the motor is concerned, it may be advisable to use a large one for reasons of reliability and weight. On the other hand there are several disadvantages to large, heavy models. Large ones are inconvenient to transport as well as being more expensive and laborious to construct. Heavy models create more damage to themselves and objects they may strike. From this standpoint, therefore, it is advisable to make your "gas job" as small as possible.

It appears that the whole project depends on the development of small engines that are as reliable and as light for their power as large ones.

The size motor that seems to fulfill all requirements to the greatest degree at the present time develops 1/6 to 1/5 horsepower. Such motors are very light and reliable. The weight of the complete motor unit developing this amount of power, usually runs from 18 ounces to 23 ounces. This weight includes motor, spark coil, condenser, batteries, wiring, spark plug and gas tank.

Power-Size Ratio

The next question to be answered is—what are the limits of size of the plane which will carry such a motor, and what particular size should it be in order that it will have the greatest flight duration with a given amount of fuel?

When calculating the rate of climb or flight capacity of large planes, it is necessary to determine the exact horsepower required to fly the plane in level flight without climb. This requires that the resistance or drag of the plane is known at the level flight speed which is just sufficient to keep the plane aloft. The calculation of this drag is detailed and laborious. In fact a certain amount of advanced engineering is required if a fair degree of accuracy is to result.

The power required to pull the plane forward at this speed is then calculated. The excess power developed by the engine is then the amount available for climb. Before this can be calculated, however, the actual drag of the plane at the climbing speed

(Continued on page 62)

NOTICE

Rubber Power Model Builders

In order that rubber powered model builders shall not feel neglected because of the emphasis on gas models in this series of articles, the author takes pleasure in presenting a simple formula by means of which model builders may determine approximately the number of strands that should be used in any rubber powered model airplane. The formula is as follows:

$$N = K \left(\frac{WP}{A} \right) \sqrt{\frac{D^2}{a}}$$

In the formula (N) represents the number of strands; (W) is the total weight of the airplane; (P) is the pitch of the propeller; large (A) equals the total wing area; (D) equals the propeller diameter; (a) equals the area of the propeller blades; (K) is a constant which changes numerically with the size of the strands that are to be used and with the rate of climb desired.

The following values of K for various rates of climb are for rubber bands which have a cross section of 1/8" x 1/30".

Values of (K) for single surface wings:

For a low rate of climb K equals 11.2.

For a medium low rate of climb K equals 12.8.

For a medium high rate of climb K equals 14.4.

For a high rate of climb K equals 16.7.

Values of (K) for double surface wings:

For a low rate of climb K equals 10.

For a medium low rate of climb K equals 11.5.

For a medium high rate of climb K equals 13.

For a high rate of climb K equals 15.

If model builders wish to use 3/16" instead of 1/8", or any other size of rubber strands, simply reduce the rubber strands you wish to use to the equivalent of 1/8" x 1/30". For instance, if ten strands of 3/16" is to be used on your model this will be equivalent to sixteen strands of 1/8" x 1/30", as 3/16" is one and a half times 1/8".

(The author will be pleased to hear whether or not you obtain interesting results from the use of this formula, which he has developed and presented here for the first time.)

Chas. H. Grant.

AIR WAYS

HERE AND THERE

What Readers Are Doing to Increase Their Knowledge of Aviation in All Parts of the World. Tell Others What You Are Doing

Air Ways Club News

Send Your Model Plane Pictures

IF ANY model builders have some ideas they would like to pass on to other readers of MODEL AIRPLANE NEWS we will be very interested to hear them.

Robert C. Morrison of 410 North Euclid Avenue, Pasadena, California, is not only one of the oldest readers of the magazine, but has contributed considerable editorial material over a period of years. He shows us what the new Curtiss P-37 Pursuit looks like by furnishing an excellent drawing of this ship, which appears at the head of the column. It is said that this plane is the fastest military plane in the world today. That means that it is near the 400 miles per hour mark.

Nicholas E. D'Apuzzo of University Heights, New York City, % N.Y.U. Student Mail, sends us picture No. 1. We consider the ship shown to be the finest specimen of model work that has come to us this month. It is an exact scale model of a Hall Aluminum Aircraft Corporation flying boat. This model was made by D'Apuzzo for the Hall Aluminum Aircraft Corporation and was in the Coast Guard exhibit at the Chicago International Air Show. The workmanship is perfect.

Picture No. 2 shows two excellent scale models built by Leland Ruffner of 1321 30th Street, South Bend, Indiana. The picture really does not do justice to them. The Martin Bomber has a thirty-five inch wing span and embodies complete details, which include movable controls from the cockpit, complete interior, pilot's cockpit, gunners' pits and places for the radio man and bombardier, all of which cannot be seen from the outside. The motors are in

complete detail and the landing gear is retractable. The wings and cowls are all metal-covered. This ship won first place for Ruffner at a recent contest, which netted him a trip to Chicago and a tour of the American Airlines Terminal there. The Aeronca shown beside the Martin Bomber is constructed with the same details.

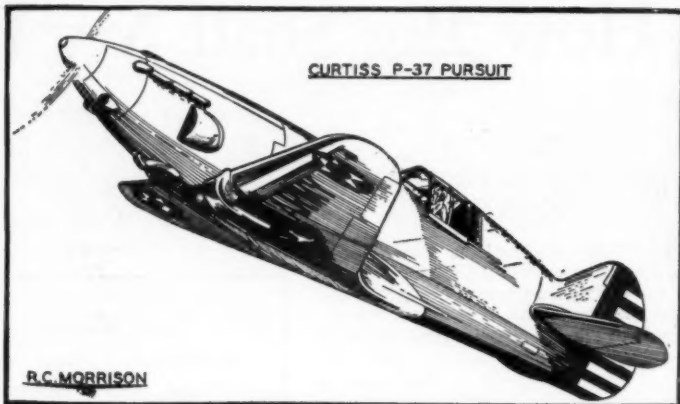
The Winnie Mae flying scale model, shown in picture No. 3, was built by Edwin Wood of 229 Cascade Drive, Mill Valley, Calif. We are sorry he does not tell us very much about it. However, we have reason to believe that Edwin is a comparatively young model builder; consequently he deserves praise for the fine-looking job he has made of this model.

Scouts Study Aviation

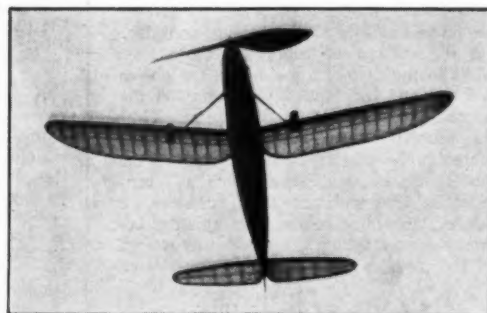
A job in commercial aviation is the aim of twenty Sky Scouts who are preparing for their future in aeronautical ground schools. The trimotor sky liners at the Kansas City Municipal Airport are their classrooms. One night each week the TWA Sky Scouts assemble in their clubrooms which are filled with the trappings of aviation. All

CURTISS P-37 PURSUIT

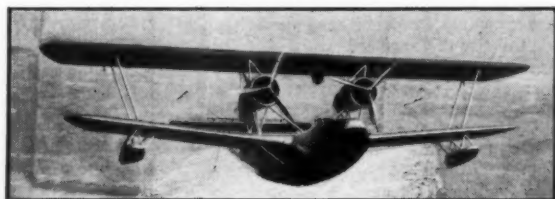
R.C. MORRISON



sorts of airplane parts decorate the walls, such as a cut-away Wright Cyclone engine, carburetor and magneto, blueprints on the walls and a parachute outstretched overhead. Ground school instruction is given them by the airline's educational director. Before the evening is over the boys visit the shops in the huge hangars to receive first-hand knowledge of the assembly and repair of airplanes. Their



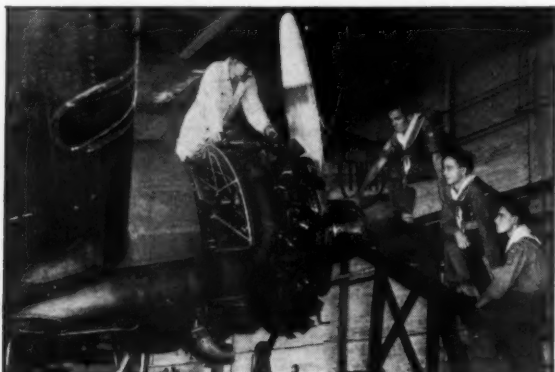
Pict. No. 5. Dick Korda's new Wakefield model has a planked balsa fuselage and weighs 8 1/4 oz.



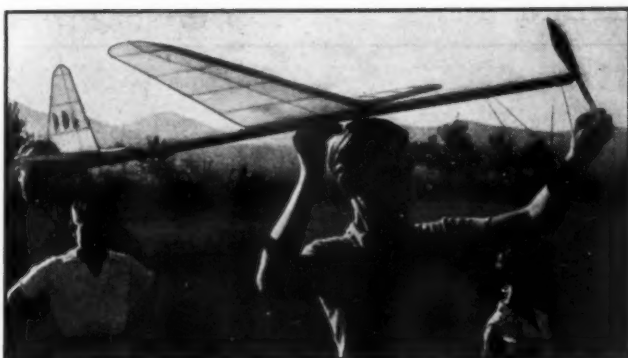
Pict. No. 1. A perfect scale model of the Hall Flying Boat PH-2 on exhibition at the International Air Show, by D'Apuzzo.



Pict. No. 8. This gas model by Otto Dunhofer rests picturesquely on a lagoon in the shadow of Mt. Corco Varda, Rio De Janeiro.



Pict. No. 4. Air Scouts receive a course in practical aviation at the Kansas City Municipal Airport.



Pict. No. 9. An Italian model builder launches his tub stick model in Italy. Note the long motor and small propeller.



Pict. No. 10. Reginald Denny and John Barrymore, in costume, discuss model problems. The little ship is a Denny gas job.



Pict. No. 7. An Australian Wakefield model that has flown for 9 min., 10 2/5 sec., by C. Hazzard.



Pict. No. 6. Korda's speed job that has won three contests at speeds up to 75.5 m.p.h.

studies consist of aviation history in the United States, science of simple aerodynamics and the theory of flight. These apprentice aviators also are building four foot flying models conforming exactly to large scale planes.

As the boys progress in the technical and mechanical ramifications of aeronautics, through eight degrees into which their curriculum is divided, they are able to decide what specialized branch of the industry most appeals to them, and to continue their studies in that direction. Two of these pioneer Sky Scouts are preparing for positions in the publicity department, one is delving into advertising, another is specializing in law;—distinctive fields which are wide open because the airlines need trained men who not

only know their own professions, but who also understand the air transport business. Whatever phase of the work he chooses, somewhere in the varied channels of aviation each of these boys may eventually secure a position where his chances for success are virtually sky-high.

Although the Sky Scouts are only a few months old, plans already are being formulated to extend the ground school curriculum which they are studying not only to the farthest ports of the sponsoring airline, but also to project it into the educational activities of other air transport companies, widening the field of opportunity to include more and more young men in this fastest growing industry of the twentieth century.

In all probability, the future course of the adventurous business of aviation will be ably piloted by these exceptional boys who are being taken literally under the wings of the nation's expert birdmen.

Picture No. 4 shows three of the Scouts intensely interested in the complications of the huge motor of one of the transports.

Picture No. 5 is the work of one of our foremost model builders, Richard Korda. It shows a Wakefield model in the act of gliding in for a landing. (Or is it strung up on wires?) We are in doubt about this. This ship has some interesting features. The body is entirely planked with 1/16" balsa and also has aluminum tubing to hold the removable landing gear in place. The 208 square inch wing comes apart in the center and is mounted through a small slot in the fuselage. The landing gear is streamlined bamboo and has 1 3/4" air wheels which take the hardest landings without breaking. The rudder has a small movable section for flight

adjustment. This is a very interesting and convenient feature. The area of the stabilizer is about 33-1/3% of the wing area. A sixteen-inch propeller turned by twenty strands of 3/16" brown rubber drives the ship. Ready for flight it weighs 8 3/4 ounces. It has a fast climb and is very stable. The average for three flights during December was two minutes, twenty-five seconds.

Builders who are interested in Wakefield models will be pleased with the plans for the Wakefield job that will soon appear in MODEL AIRPLANE NEWS. A ship built to a similar design in Australia flew for over nine minutes. The ship will be based upon the design which has appeared in Mr. Grant's series of articles. We might say that the plane is all ready to build and gives remarkable performances.

We have another contribution from Mr. Korda. This is shown in picture No. 6. It is a speed model which has won three contests; one at 60 m.p.h.; one at 75.5 m.p.h. and the other at 70.83 m.p.h. It won the Junior Thompson Trophy twice in succession. This is what we call a super-speed model, and so far as we know, out-classes any performance in every ship in the world.

Brymond Robison of 2316 Caroline, Houston, Texas, suggests something helpful in the finishing of solid models. He says:

"After the model is assembled, smooth down the surfaces with fine sandpaper and apply heavily a fine grade of polishing wax. Rub this down until glossy with a cloth. Then paint the model. When it is dry apply a light coat of wax and rub again until the surface is smooth."

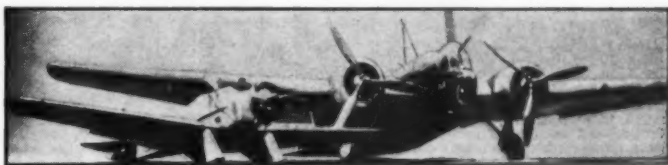
Carlton W. Cooper of 4 1/2 North Church Street, Cortland, New York, suggests a cure for leaky landing wheel tires on models. He says:

"When the tires become leaky on the inside surface which fits down inside the hub, roll the tire back from the hub as far

(Continued on page 54)



Pict. No. 3. A neat flying scale model of the Winnie Mae, by Edwin Wood.



Pict. No. 2. Scale models of a Martin Bomber and Aeronca low-wing, built to careful detail by Leland Ruffner.

THIS IS WHY

**C-D Satisfaction
won't be stifled
—it must express
itself!**

"In seven years of modelbuilding, I have never seen anything that can compare with C-D Kits. I intend to influence others to Joliet model-builders towards your Kits."

★

"Just happened to be looking through 'Model Airplane News' for the first time in several years, and your very attractive ad in the late issue 'took my eye.' So I decided to build a model—and I don't know of any better way to spend my spare time, as probably the reason I'm here right now is to be attributed to the fact that I was once a Cleveland 'fan'."

By a Member of 31st Bombardment Squadron, Hamilton Field, Calif.

★

"Your Howard 'Pete' has so much quality and detail that I have already ordered another C-D Kit."

★

"C-D's won the Grand Prize and two other prizes in our model Air Circus."

★

"I see this misleading statement on your Gee-Bee plans: C-D drawings will be found more authentic than most any others. It isn't most any others—they ARE the best, most authentic, and detailed."

★

"My C-D Kit arrived so soon, I thought it came by air mail."



★

Westfield, N.J.



C-D's NEW P26-A FIGHTER

This new U. S. Army beauty has a really dazzling appearance—now the most colorful of all C-D's. The photograph of it above just could not do it justice. Model will make high speed flights for good distances. Colored yellow wings, blue fuselage and landing gear with a dazzling tail of white with red scallops, fuselage and wheel shoe trimming is a wide white stripe with a red stripe running through it. Span 21". Complete Dry Kit

SF-60, only \$2.65

Complete Dry Kit D-60 (span 14"), only \$1.10



BOEING P-26 STANDARD PURSUIT

Formerly the XP936. Very popular. Much imitated. Modern pursuit model of a low wing design. Authentically detailed to the tiniest gadget. Span 21 1/4". Suggested coloring: yellow, olive and olive drab. Dry Kit SF-23, only \$1.95

Complete Dry Kit D-23 (span 14 1/4"), only 70c



HOWARD RACER "PETE"

This tiny 90 H.P. racer has been flying at National Air Races for several years. Model is easily built and flies well. Recommended to both beginners and old timers. Should be included with any line-up of race planes. Span 10". Color, white and black details. Dry Kit D-18, only 40c

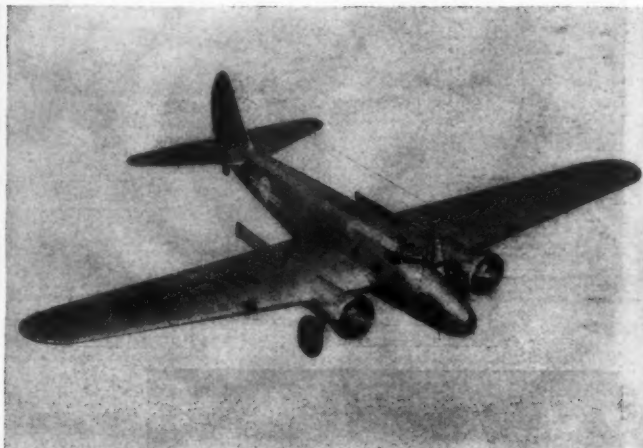
Complete Dry Kit SF-18 (span 15"), only \$1.25

Sensational U. S. MARTIN BOMBER

This modern military bomber is representative of American designing skill and is the pride of the bombing squadrons. Known to travel at a rate well in excess of 200 M.P.H. It is really versatile. May be used for bombing, attack, observation, transportations of officers, troops and fighting equipment. Our drawings are very complete and easy to follow, having many photographs of covered and uncovered views of model. The kit is very complete and has all special wood blocks band-sawed to shape and size. Cowling, wheels, bearing buttons and flying propeller hubs are already turned. All wood parts printed, as usual, in fine accurate lines on good sheet balsa and if you haven't built many models, don't be too reluctant in getting this kit because the drawings leave nothing to your imagination for it's easy to build models the C-D way you know. Span 53 1/4". Should be colored yellow and olive drab. All insignia furnished. The complete Dry Kit SF-45, only \$6.50



Complete Dry Kit D-45 (span 55 1/4"), only \$2.95



UNITED AIR LINES BOEING 247

The model which weighs 16 ozs. has such a tremendously large area in addition to its thick airfoil section that the weight means but little. It is a steady, consistent flyer and will rise, in most cases, to about 40 foot altitude and flies from 250 to 400 feet on an average, although much longer flights than this have already been made. This model, which has a wing span of 55 1/4", length 38 1/2" and being colored all silver, makes an impressive sight to behold with both of its motors powerfully pulling it high in the air. The landing gear is especially well designed, utilizing 1/16 diameter music wire for the axle material. Among the material supplied will be found in addition to the usual standard parts as in all C-D models the following: Extra heavy music wire for landing gear, black tissue for all lettering, tapered leading edge pieces for wings, large and small nose blocks necessary for balancing purposes, two large special balsa wheels with bronze bushings. Material and instructions for scale propellers, drilled aluminum tail wheel piece, two turned balsa end rings and two turned balsa fronts drilled to accommodate C-D type of bearing button with bronze bushings also supplied and one right and one left hand C-D "Standard steel" type slotted and drilled propeller hub for flying propeller, plenty of celluloid for windshield and windows and four panels of the extremely large size, thoroughly C-D engineered drawing, size 34 x 88 inches, making a grand total of over 20 square feet containing four large clear photographs and all instructions necessary to complete the model. Order complete Dry Kit (meaning, no cements or dopes included) SF-35, only \$5.95

Complete Dry Kit D-35 (span 37"), only \$2.95

EUROPEAN CUSTOMERS!

Modelbuilders in Europe may purchase C-D Kits for exactly the same prices shown here, plus postage only. Payment must be included with order in bank checks, either in U. S. dollars payable in New York or in Swedish Crowns, one crown being equal to \$2.25, check payable in Stockholm. No C-D's accepted from Sweden. Write to: H. Ilen, Nybokaiken 7, S-103 Stockholm, Sweden.



RYAN SPORTSTER ST

This beautiful little two place job is well known to modelbuilders everywhere and our model looks as pretty as does the prototype. Span of course 20", suggested coloring, all silver, like the prototype. Model stable and fast.

Kit R-58, only 65c

Ohio residents only add 3% Ohio sales tax.

"The Modelmaker's Bible"



CLEVELAND MODELMAKING NEWS

Issue No. 1. Contains full size scale drawings for 15 different model projects including: 3/4" Heath Parasol and Doolittle's Gee-Bee Super Sportster; 1 1/2" Howard "Pete"; 1/32" Christopher Columbus "Santa Maria"; and a great many other projects. Also many interesting hints and articles on model work found nowhere else. If you haven't this great issue—send 25c at once for your copy.

Issues 2, 5, 6, 7, also available at 25c each, or full set of all issues (1-2-3-4-5-6-7) for \$1.50 postfree.

This famous all country is by our own famous country racing and design data). It is in blue with a white area. Both stations (for exhibition and winning). Complete



MONOCOQUE PORT

Two place monocoque country racing and design data). It is in blue with a white area. Both stations (for exhibition and winning). Complete

CLEVELAND "AIR-ISTOCRATS" WIN MORE PRIZES AND MORE ANY OTHER LINE OF MODELS

CLEVELAND "AIR-STOCRATS"

"The Models that Look Even Better Than Their Pictures"

THE OVERWHELMING FAVORITES EVERYWHERE

No finer kits made anywhere in the world, attempts to imitate are poor. The most authentic models possible to design, yet capable of excellent flights. Master Model Builders kits—you're a real modelmaker when you use C-D's.

4. First prize winners everywhere with their super-detailed external details.

5. The most beautiful and vividly colored models available, colored with a dope that lasts for years, not the usual variety which allows the tissue on a model to

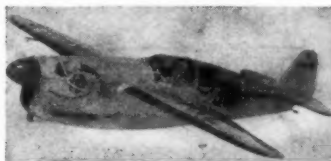
crack up very badly within a few months.

6. Models are under-priced considering the beauty of the finished models made possible by the engineering quality of each design and quantity of materials contained within each kit.

That's why they're "The most imitated line of flying models in the world"



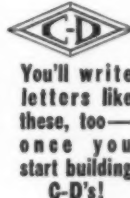
1937 FOLKERT'S SPECIAL
Popular twins are known to all air race fans, when many first place prizes. Our kit from which you may build either one, is easy to assemble and makes a beautiful decorative home ornament yet capable of interesting fast flights. Span 15 3/4". **95c**
Complete Dry Kit SF-42.....
Complete Dry Kit D-42 (span 10 1/4"), only **38c**



1937 THOMPSON TROPHY WINNER
Like a flying torpedo. Fast, trim, unique. Has a neat little retracting landing gear, and fuselage flap over it, very easily made. Colored all cream with red trimmings, and black and brown details. Span 12". **\$1.95**
Complete Dry Kit SF-71, only.....
Complete Dry Kit D-71 (8" span), only **65c**



The Talk of the British Empire
DE HAVILLAND "COMET"
High speed flyer, pulled by 2 powerful little motors. Extraordinarily beautiful. Span 22". Kit absolutely complete (but NO LIQUIDS). **\$1.35**
Kit D-51, post free, only.....
(THIS DESIGN NOT AVAILABLE IN OUR 3/4" SCALE "SF" TYPE KITS)



You'll write letters like these, too—once you start building C-D's!

"Your advertising does not begin to do justice to your kits."
Chicago, Ill.

"I have 12 of your models, and find it impossible to compliment you enough. One can learn more of value from your kits and methods of construction than from any others."
New Haven, Conn.

"Your modeling is sure sold me on the C-D line."
Jersey Shore, Pa.

"I think C-D models are the most realistic I have ever seen."
San Francisco, Calif.

"You are the only company that could supply me with a perfect flying scale model."
Brooklyn, N.Y.

"Some years ago I had some rather discouraging experiences with models, and decided that a good model could not be built. However, you have changed my mind for me, and here's my second order."
Albany, N.Y.

DEALERS
Send for the "Constant report" proposition.

1938 Catalog
Features 120 "hit" kits, all imaginable supplies and parts. Also 34 new C-D Airplane-type RR Kits. Send 10c at once for your copy.

See Our Other Ad on the Back Cover

So insistent have been the requests for separate liquids with CLEVELAND "AIR-STOCRATS"

that we give below, next to the SF model itself, the price of all necessary liquids. These consist of 5 to 10 bottles of material, and also include striping tape where it is required. All Dwarf Kits are supplied dry as usual for which the two main colors, wood cement and tissue cement may be ordered separately at 10c for each bottle, or 40c for each design except designs Nos. D-35, D-45, D-55, and D-65 for which two ounces each of the four main liquids are required, totalling 72c each. Be sure to add 15c packing charge to each order for liquids. If additional colors are desired, simply add 15c per bottle. Striping tape 5c, 6c; 19c; 15c.

When ordering, be sure to include 15c additional for packing and postage on liquids, as these constitute parts, whether with or without kits. Shipments will not go forward unless the 15c is included. For example, in ordering Dry Kit SF-1 say: "Please send me the Dry Kit SF-1 at \$1.95 and SF-1 Liquids at 63c, plus 15c packing charge—a total of \$2.73."

Spans of SF, 3/4" scale Kits run from 12" to 55 1/2"; D 1/4" scale Kits, from 9" to 42 1/2"; Repts 20" to 28".

LEADERS OF THE WORLD IN QUALITY, REALISM AND VALUE

KIT NO.	NAME	SF Scale	SF Scale	D's Scale	REPS 20" Span	KIT NO.	NAME	SF Scale	SF Scale	D's Scale	REPS 20" Span
1	Gr. L. Sport Trainer.....	\$1.95	.63	.65		37	Waco C Cabinplane.....	2.65	.95	.95	
2	Travel Air Mystery.....	2.35	.95	.65		38	Buhl Bull Pup.....	1.65	.50		
3	DeHavilland-4.....	2.85	.95	.95		39	B-J P-16 Fighter.....	2.75	.65		
4	Curtiss Jenny.....	2.65	.95	.65		40	Aerona Sport.....	1.95	.57		
5	Laird Super-Solution.....	1.95	.58	.65		41	Vought Corsair V-65.....	2.95	.65	1.10	
6	Polish Fighter.....	2.50	.52			42	Howard "Ike".....	.95	.43	.53	
7	Curtiss Helldiver.....	2.95	.69			43	Douglas C-38 One.....	2.95	.64	1.10	
8	Army Boeing P12-E.....	3.25	.69	.80		44	Page's Racer.....	1.95	.52		
9	Scouting SE-5.....	1.25	.42	.55		45	Martin Bomber.....	0.50	1.88	2.95	
10	Sopwith Camel.....	1.95	.51			46	Laird Solution Racer.....	1.95	.52	.85	
11	A-W Quad Fighter.....	1.95	.58	.65		47	'33 Wedell's W. Wm.....	2.35	.87	.65	
12	Bishop's Newport.....	1.95	.58	.65		48	'34 Turner's W. Wm.....	2.35	.87	.65	
13	Spad 13.....	1.95	.58	.65		49	Curtiss P11C-2.....	2.95	1.09	1.10	
14	Fokker Triplane.....	1.95	.69	.65		50	Curtiss Export Hawk.....	2.95	.95	1.10	
15	Fokker D-7 Fighter.....	2.50	.67	.75	.65	51	Dr. H. Comet Racer.....	2.35	1.35		
16	Albatross D-5A.....	1.95	.63			52	Mr. Mulligan.....	.64	.65	.65	
17	Baylis' Gee-Bee.....	1.95	.53	.65		53	Grunman F2P-1 Fighter.....			.65	
18	Howard "Fete".....	1.25	.42	.40		54	Hughes Racer.....			.95	
19	Supermarine SE-6.....	1.95	.57	.80		55	Douglas Transport.....		3.75	.50	
20	Hawker Fury Fighter.....	1.95	.63	.80		56	Consolidated A-11.....			.65	
21	Hawk P6-E Fighter.....	2.50	.99	.95	.65	57	Old Gr. L. Trainer 2T1-E.....			.65	
22	Macon Fighter.....	1.95	.63			58	Eyan ST.....			.65	
23	Boeing P-26 Pursuit.....	1.95	.68	.70		59	Hawker Low Wing Fight.....				
24	Lockheed Vega.....	2.50	.95	1.20		60	Boeing P-26-A.....	2.65	2.65	1.10	
25	Curtiss A-8.....	1.95	.60			61	Seversky Fighter.....	2.65	1.07	1.10	
26	Heath Parasol.....	1.25	.42	.35		62	Custom Waco C6.....	1.95	.87	1.10	
27	Doolittle's Gee-Bee.....	1.95	.63	.65		63	'36 Caudron Racer.....			.65	
28	Monocoupe Sport.....	1.95	.63	.65		64	Beechcraft C-17-B.....			1.10	
29	Boeing F4B-3 Fighter.....	3.25	.99	.80		65	Lockheed Electra.....			2.75	
30	Nieuport 28 Fighter.....	1.95	.58			66	Stinson Heliant.....			.65	
31	Hall Racer.....	1.95	.58	1.20		67	Fairley Battle.....			.05	
32	Boeing 95 Mail.....	1.95	.68			68	'17 Bristol Fighter.....			.65	
33	Comper Swift Sport.....	1.25	.42	.45		70	William's "Gulphawk".....			.65	
34	Fokker D-8 Fighter.....	1.95	1.45	.85		71	King's Folkert Special.....		1.05		
35	Boeing 247 Transport.....	5.95	2.95			72	Poston Kit.....	.35			
36	Lincoln Sportplane.....	.95	.42	.25		73	X-5001 Cleve. Amphibian (38").....			.65	

COMPLETE GAS KITS (built without power units) with 3 1/2" balsa wheels, shoes, cements and colors.

OP 66 Stinson \$12.50
OP 68 Bearwin \$5.50
If 3 1/2" M & M wheels are desired instead of balsa, add 85c, mentioning you wish Pneumatic wheels.
EXTRA PARTS \$4.00
Enclose 5c Packing and Postage or we'll send by Express charges only "Collect" on GP66 and GP69 only.
ORDERING INSTRUCTIONS: All direct orders subject to our regular shipping terms. Send check or M. O. (cash at own risk). No C.O.D.'s. To U. S. Possessions, Canada and British Isles, add 10% extra; all other countries, 20%, except those which have a "transit charge" then add 40%. Be sure to include 10c for No. 3 Catalog if you don't have a copy.

CLEVELAND MODEL AND SUPPLY CO., Inc.
4508-B27 Lorain Ave. "Model Engineers Since 1919" Cleveland, Ohio, U.S.A.



"GULPHAWK"
or AL W. FAMOUS SHIP

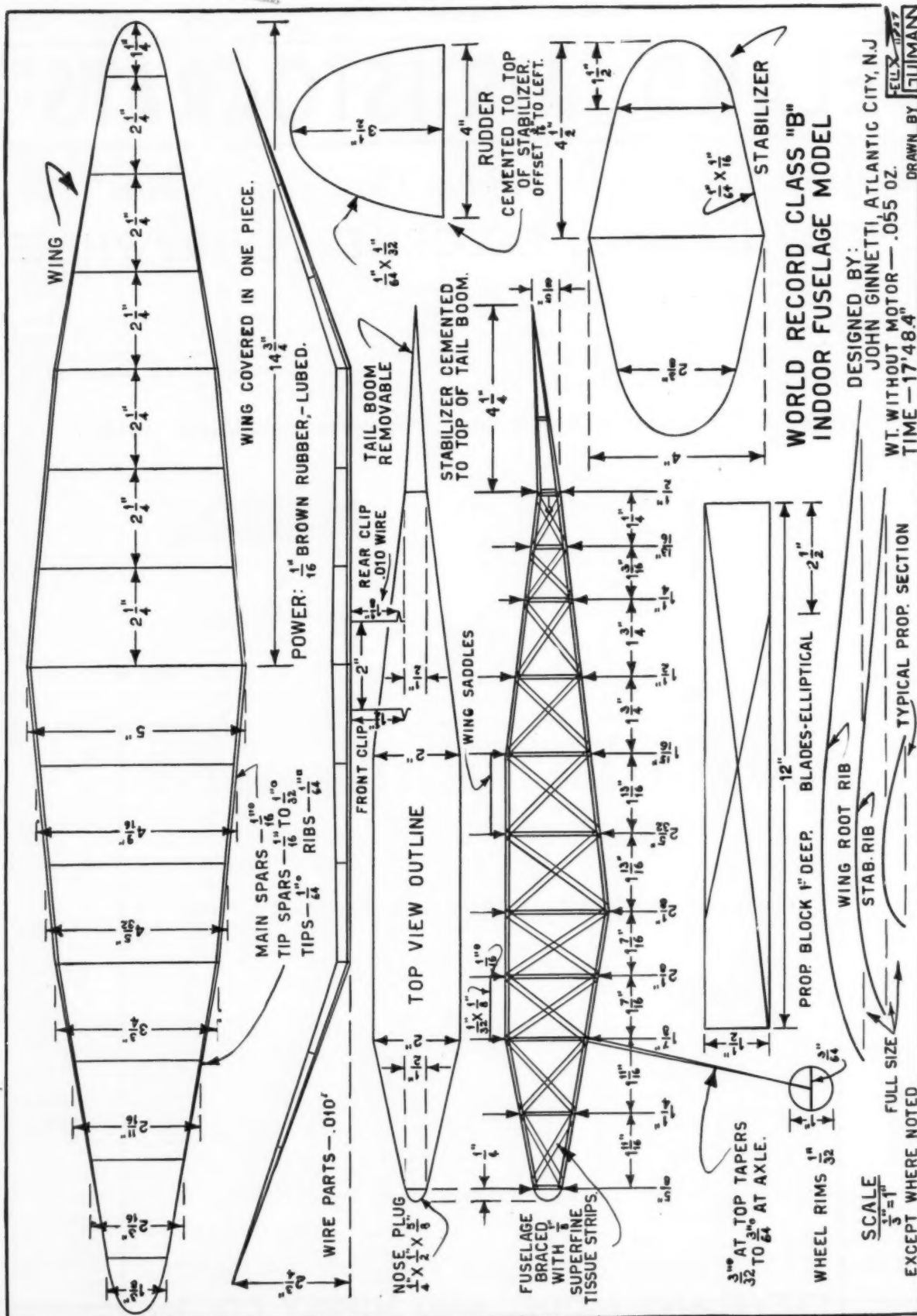
is piloted exclusively by Alfred J. Williams (to be made in the U.S.A.) and is being made in the U.S.A. It is a "Gulphawk" biplane, being exceptionally strong, having plenty of wing area, and a retractable landing gear. It is a contest model. **85c**

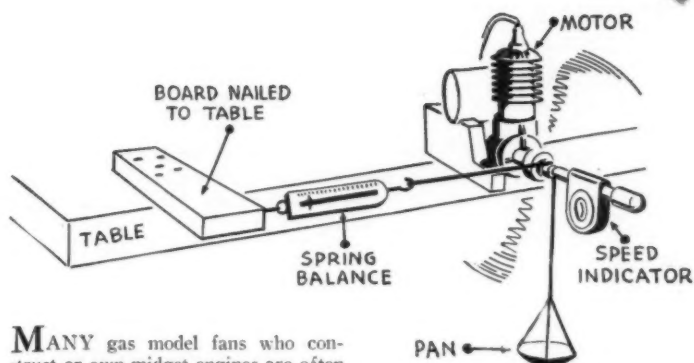


PORTPLANE

used for pylon, cross and other types of flying. Very popular and to nearly all. A "first prize" model. Suggested colorings range from **\$1.95** to **\$2.75**. **\$1.95**

more than 100 models in the world





How Much Horsepower?

How to Build and Operate a Device For Determining the Power of Your Engine

By CYRIL S. FINEGOLD

MANY gas model fans who construct or own midget engines are often troubled with the above question. So are the fellows who assemble engines sold in kit form. Usually the horsepower at which the manufacturer rates his engine is not always correct. In many instances it is merely 80% of the theoretical power. Small gas engines, especially those of the two cycle type, are somewhat similar to women—no two are alike. The horsepower available to the propeller depends on a number of important factors—friction, fuel, ignition, propeller and the workmanship during the course of the engine's construction.

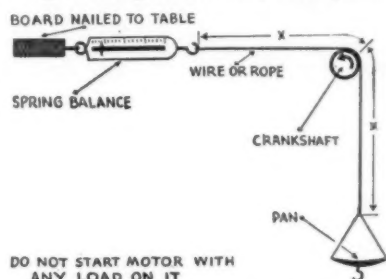
This article is intended to give the gas modeller an idea of how to go about constructing a device that can determine the Brake Horsepower of his engine. Brake horsepower (B.H.P.) is the useful power obtained from the engine, or the actual power available to the propeller.

In order to measure the B.H.P. an apparatus called a dynamometer is used. There are two forms of dynamometers in common use, namely, absorption dynamometers and transmission dynamometers. After a great deal of careful investigation, it was found that the absorption dynamometer was the only kind which could be fitted on most gas engines on the market today. In this type, all the B.H.P. is absorbed by the dynamometer or brake.

A very effective arrangement is to put a rope brake on the fly-wheel of the engine

or on the portion of the crankshaft which protrudes after the correct propeller is properly in place.

The brake consists of a rope, leather thong or strong flexible wire, which passes



over the crankshaft (or fly-wheel), one end being attached to a spring balance, and on the other end, a pan is hung. The weights are placed on the pan. The type of spring balance sold in the five and ten cent stores can be used if they are calibrated correctly. If they are not correct, calibrate it yourself by using known weights. The direction of rotation being as shown by arrow.

The construction of the brake as shown can be modified to suit individual conditions, but the following must be kept in mind:

(a) The direction of rotation must be the same as shown. If it is opposite, the apparatus is reversed.

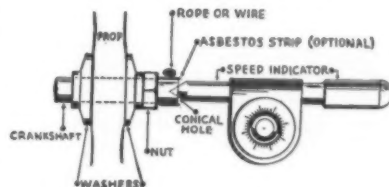
(b) The distances (xx) as shown in Fig. 1 on the rope must be equal.

(c) Spring balance must be fastened securely while motor is being tested.

Let us imagine ourselves testing a motor of unknown horsepower. The brake is ready to be used. Fasten the motor on a table or work bench securely. Start the motor going, using the right prop, fuel mixture, spark, etc. The spring balance is made fast to something solid. Incidentally, it might be appropriate to mention here, to fix the rope brake in such a position that when it is on the motor, it does not interfere with the doings of the prop, because props have a bad habit of arguing the right of way, and very seldom leave the argument second best. See that the rope is at right angles

(Continued on page 54)

GENERAL ARRANGEMENT



An Indoor Record Breaker

By
JOHN GINETTI

Here Are Complete Instructions to Build a Duplicate of the Class B Fuselage Model That Holds a World's Record

IT REQUIRED several years of experience in order to design this Class B cabin model that anyone can build and fly with great success.

It was designed originally for a Junior Birdmen meet, and was entered for the first time in the Washington Wing Championship elimination. The time of the first flight was 6 minutes and 40 seconds with 700 turns. The model climbed about 40 feet and landed with only a few turns. This time easily won first place.

The model was put away for the championship finals which were held in San Antonio, Texas. At that meet also the model made only one flight, which ended in disaster after flying for 13 minutes and 46 seconds. The ship landed on the girders at the roof of the hangar. After the plane was

retrieved it was impossible to fly it any more that day. With great patience the model was packed, with intentions of rebuilding it for the 1937 Nationals which were to be held in Detroit, Michigan, in July.

In Detroit three flights were made with the model. The first official test flight was 13 minutes and 14 seconds. The second flight was 13 minutes and 42 seconds which ended in a collision in the air with another model, which naturally took both planes down to the ground; very disheartening I must admit.

If ever I should break that record, it had to be on the next flight, my last one for that year. My mind was made up to gamble by fully winding the model to capacity which was about 2800 turns and

then holding the model for a good five minutes and also getting the kick out of letting the propeller spin out the tremendous initial power. After this was done I let the model take off. At first it seemed as though it would never get up. It took 11 minutes to climb seventy feet. Nearly seven additional minutes elapsed while the ship was descending. It landed with about 125 turns with a good ceiling of 150 feet. Under the right conditions this model will crack 21 minutes.

Wing Construction

Let's start by building the wing. The wing spars for the center section are built from five pound per cubic foot balsa stock. Cut two spars 1/16 diameter by 13 1/2" long and sand perfectly smooth. Next cut the tip spars 1/16 tapered to 1/32 and also sand. The wing tips are 1/64 stock cut

(Continued on page 46)

BOYS!

HERE'S YOUR CHANCE TO SAVE
ON YOUR FAVORITE MAGAZINES!



Here's a smashing buy—just look at this bargain price. **MODEL AIRPLANE NEWS**—the magazine for all Model Airplane Enthusiasts—every month for a whole year—and **OPEN ROAD FOR BOYS**—every month for 2 whole years—36 magazines for only \$2.00. An amazing BARGAIN offer for you.

In **OPEN ROAD FOR BOYS** you'll get thrilling stories of adventure and mystery, of baseball, football, hockey, and all other popular sports, with instructive articles by famous players and coaches; stories and articles on Camping and Hiking; sparkling tales from every part of the world and from Pole to Pole; from the Old West and the Far East; stories that will interest and fascinate you from start to finish. Mystery, Adventure, Comedy, School Stories, Funny Stories and others. Also departments devoted to Stamps, Cartoon Contests, Jokes and the Pioneers' Club conducted by Deep-river Jim and the Campfire Chief. If you've never read **OPEN ROAD FOR BOYS** you have a real treat coming—and this is your opportunity to get acquainted on this SPECIAL COMBINATION offer.

By subscribing now you'll get 12 issues of **MODEL AIRPLANE NEWS** and 24 issues of **OPEN ROAD FOR BOYS** for only \$2.00.

YOU SAVE \$2.80!

FILL IN THIS COUPON AND SEND IT OFF RIGHT AWAY!

Model Airplane News N4
551 Fifth Ave., New York

Yes, Sir! I want those 36 Magazines (12 Copies of **MODEL AIRPLANE NEWS** and 24 Copies of **OPEN ROAD FOR BOYS**). Here is my \$2.00.

Name..... Age.....

Address.....

City..... State.....

Magazines may be sent to different addresses

This offer good in the United States and its Possessions; also Canada, Cuba, Mexico and Panama. All other countries \$4.00.

Soaring Flight

(Continued from page 11)

ments, cannot soar except under very good conditions directly indicating a strong upward current either thermal or induced by obstructions to the wind. Even in a high gusty wind where the varying forces support a buzzard or a frigate with ease, the pelican will often resort to flapping flight. On one occasion coming in from the Gulf of Mexico I did see a pelican rising in circling flight at a height of about three hundred feet. This was easily accounted for when our boat passed from cool air into a very warm zone directly under the place where the pelican was flying. The weight of the pelican enables him to make some remarkably long glides close to the surface of the water and these exhibitions have probably been mistaken by observers for real skill in soaring which I do not think should be credited to the pelican. My affection for the bird, admiration for his general airworthiness, ability to perform a vertical dive and eat unimagined quantities of fish remains unchanged. The pelican may be easily tamed and studied in the air at close range. I lived at Bokeelia, Florida, for some months and made the acquaintance of an old pelican which would come down out of the air immediately when his name was called and make a general nuisance of himself stealing fish out of baskets, nets and even from hand lines.

The buzzard is absolute master of the air and of soaring in light air currents under all conditions. Given one hundred feet or so of altitude attained by easy flapping flight he starts circling and goes where he darn well pleases. Extended observation of these flights reveals some interesting facts regarding both bird and performance.

The dihedral angle of the wings differs greatly with various buzzards and the same buzzard under different conditions. Generally the dihedral is reduced in light winds and in exceptional cases the bird is seen soaring with wings practically straight out from the body. When describing circles of small radius the dihedral is increased and in high winds the upslant of the wings is marked. Steering is evidently accomplished by minor wing movements and tail action. Sweep-back and sweep-forward of the wings takes care of ascent, descent and fore-and-aft balance with an occasional "W" plan form although this is not so marked as in the frigate-bird which flies normally with reflexed wings as shown in the sketch.

The frigate-bird is of a form in marked contrast to the buzzard and closely approximates the most advanced design of modern full-size sailplanes. The frigate-bird lives in the air and is evidently designed by nature for that one purpose. The legs are so small as to be practically useless in landing or take-off and the wings so enormous in comparison with the body that these birds have great difficulty when they attempt to come to rest on a tree.

The frigate or man-o'-war is identified by a sharply forked tail, evidently used to good purpose in balancing and maneuvers. In spite of the ribbon-like appearance of the wings the frigate will fly in high winds, in marked contrast to the buzzards which

Dealer Help

We believe that we have a plan that will help you increase your sales.

It's a simple plan too—all you have to do is send us your name and address, on your own letterhead if possible. Many manufacturers have told us that they would like to augment their display advertising with personal letters, circular matter, display cards, tips on new items and other dealer helps. We believe that you will profit by our making your name available to them. Therefore if you are a model airplane dealer it will be to your advantage to send in your name without delay.

The 1938 Dealer List will be compiled beginning March 1st and ending May 1st. Address: **MODEL AIRPLANE NEWS**, Census, 551 5th Ave., New York City.

generally seek shelter. The wings of the frigate undulate gently and occasionally quiver in soaring flight which is generally at low speed indicating the great reserve of supporting power. The frigate dives, takes small fish from the surface of the water and usually sails aloft again with little effort. If necessary, in a calm the bird is capable of graceful, slow flapping flight and in one instance I watched a frigate at sunset slowly flap his way for over a mile at a height of about five hundred feet. This observation was exceptional since the frigate is almost always seen in perfect sailing flight at heights varying rapidly from one hundred feet to five thousand feet.

The frigate can definitely outfly the buzzard in high altitude thermal updrafts. I have repeatedly seen four or more buzzards and two or more frigates in the same current and all circling in the same direction, the ascent of the frigates being definitely superior and in fact continuing after the buzzards reached their ceiling. This performance always bears the earmarks of a climbing competition.

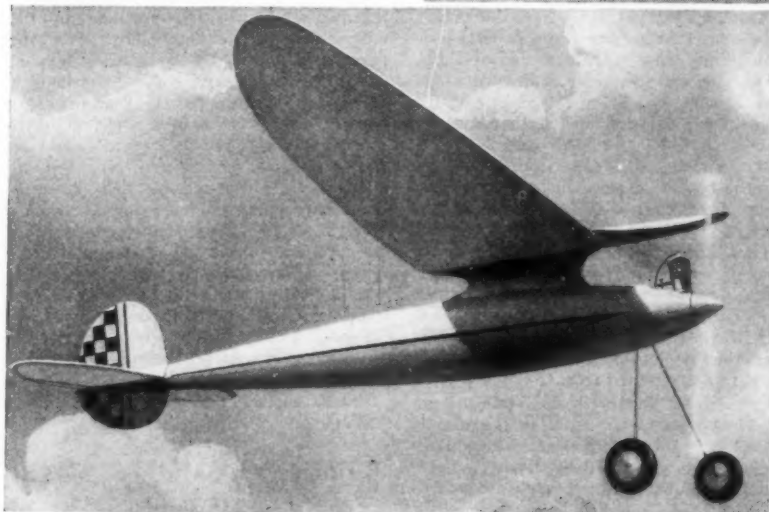
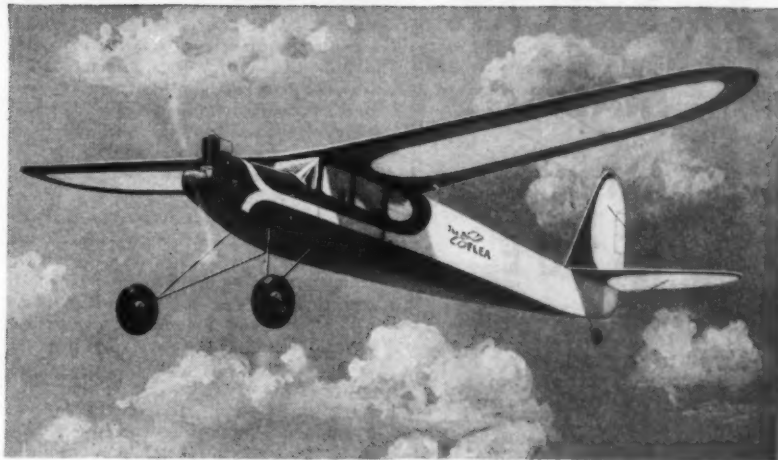
In addition to high performance circling flight the frigate is a master at "kite flying" remaining motionless in the air at a height of five hundred to one thousand feet for hours at a time except for brief trips down to the surface of the water after a fish, returning generally to the same spot or patrol in the sky.

The general conclusion I draw from a study of the flight of these birds is that they truly employ the internal work of the wind down to the last drop in addition to soaring

NATIONWIDE HITS

All the Thrills of Gas Powered Flight Without the Expense!!

This new type of Model Airplane construction will give you all the thrills and excitement of building a real gas job. Thousands of builders have constructed these remarkable models and gotten truly thrilling flights. Build one yourself now and experience the fun you, too, can have with either of these fine flyers!



VALKYRIE

Wingspan 24 in.

Length 15 in.

Designed by Indoor Champion **CARL GOLDBERG** in Miniature Duplicate of his Prize Winning Original Which Won Second Place at the "NATIONALS," Detroit, 1937.

Streamlined Fuselage—Moveable Control Surfaces—Shockproof Landing Gear



FLIES 1/2 MILE
(2,500 Feet)

100%, including ready wood engine cylinder with spark plug and wood parts for crankcase, exhaust pipe, air intake, throttle, etc., just like a real gas engine.

COMPLETE CONSTRUCTION KIT with FULL SIZE PLANS and INSTRUCTIONS

POSTPAID or AT YOUR DEALER

The "VALKYRIE" incorporates all the attractive and outstanding features of its gas model original; can be easily constructed in 4 or 5 hours. Sturdily built with continuous one-piece wing root built into fuselage and securely attached to under side of wing. Also includes the "Ratchet," a device that makes it sound like a real gas model when in flight. Dummy motor looks like the real thing and is easily built. Beautifully colored; yellow fuselage and tail, black arrow on body, colored squares on rudder and yellow wing with black and red flashes.

KIT INCLUDES SPECIAL

BROWN CONTEXT RUB-

BER, with complete plans

and instructions and ALL

MATERIALS to finish model

100%, including ready wood engine cylinder with spark plug and wood parts for crankcase, exhaust pipe, air intake, throttle, etc., just like a real gas engine.

COMPLETE CONSTRUCTION KIT with FULL SIZE PLANS and INSTRUCTIONS

POSTPAID or AT YOUR DEALER

\$1.00



The FLEA

Wingspan 36 in.

Length 28 in.

"The NEXT BEST THING to a REAL GAS JOB." MOVABLE CONTROL SURFACES ON RUDDER AND ELEVATORS. SHOCK-PROOF, GAS MODEL TYPE LANDING GEAR with M & M RUBBER WHEELS. NEW BALL BEARING PROPELLER WASHER—BROWN RUBBER ADJUSTABLE WING with NEW TYPE WING CLIPS.

HAS FLOWN MORE THAN 2 Miles. (10,000 Ft.)

KIT INCLUDES EVERYTHING to build this remarkable model 100% complete. Completely turned and shaped wood engine cylinder and spark plug in one piece, with all other parts to build engine completely; also pair genuine 1 1/2 in. M & M Pneumatic Rubber Wheels with inflating tube, 10 in. machine cut Balsa prop; all necessary metal for "Ratchet" engine-hum device and every other detail required for a complete and perfect job, including printed insignia and full size Plans with Detailed Instructions.....

COMPLETE CONSTRUCTION KIT with M & M Pneumatic Rubber Wheels POSTPAID or AT YOUR DEALER

\$1.95

SCIENTIFIC MODEL AIRPLANE COMPANY

218-220 MA-4 Market Street

"Gas Model Headquarters"

Newark, N. J.

In France: E. Kruger & Co., 9 Rue St. Sebastien, Paris.
In England: H. & S. Norman, 46 Derby Rd., Kirkham, Preston, Lancs.
In Australia: Swift Model Aircraft, 180 Adelaide St., Brisbane, Queensland.
In South Africa: Stratosphere Model Aircraft Supplies, P. O. Box 3248, Johannesburg.

SEE PAGE 39 for Our Advertisement on GAS MODEL SUPPLIES, ENGINES, MODELS, PARTS and EQUIPMENT. ORDER FROM SCIENTIFIC AND SAVE!!

SCIENTIFIC is GAS MODEL Headquarters. We have Everything for This Thrilling Sport. Send 5c and get our COMPLETE CATALOG full of BARGAINS.

WHITFIELD'S AMERICAN MADE BAM-BOO TISSUE

after many years of experiments is now ready for delivery in colors **NATURAL, RED and YELLOW.**

JAPANESE TISSUE
Brilliant
THIN AND STRONG

AA In 32 Colors AA

JAP PROPS



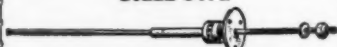
STANDARD TYPE



BROAD BLADE
50% More Efficient



STEEL TYPE



BRASS PROPELLER SHAFTS



MINIATURE CELLULOID MOTORS

4 sizes: 1 1/2"; 2"; 2 1/2"; 3"
Another Japanese Import

These lightweight motors have been designed to our specifications. Every detail of the original radial engine has been accurately reproduced even to the cow plate at the front. They are a distinct improvement over any other dummy motor. At Whitfield's low price, they can be easily included in every flying model kit.

We Pay Shipping Charges

WHITFIELD PAPER WORKS

Note New Address:

76 VARICK ST. NEW YORK CITY
Established 1889

technique as developed by sailplane pilots. The wind beats against their wings instead of the wings beating against the wind as in flapping flight and the wings are flexible so that a constant propelling or "sculling" force is exerted without effort on the part of the bird. This effect is not obtained with the relatively stiff wings of the sailplane or with the balsa contest gliders. Many attempts have been made of course, to use flexible wings on sailplanes but a workable combination has not yet been found. Perhaps we now have a proper scientific approach in the balsa glider and we may be able to introduce flexibility without losing the excellent gliding qualities already developed.

In order that we may appreciate the propelling power inherent in the natural wind as utilized by soaring birds, let us examine the record made by Zahm some years ago showing the vertical and horizontal variations of direction during a period of only ten seconds. We see that the wind deviates both ways over twenty degrees from a straight line so that a bird facing the apparent wind is really "quartering" at all times if its wings are flexible, the body of the bird travelling straight or with slight undulations while the wings given under the varying pressures and produce definite thrust in the direction of flight.

This peculiar advantage of flexible wings is realized by the soaring bird in addition to other properties of moving air which are utilized both by the birds and by man-made sailplanes and balsa contest gliders. For the benefit of new students of soaring flight these effects will be briefly summarized.

The "Lilienthal Slope" is a natural upslant of the wind amounting to about four degrees resulting probably from the friction of the air over the earth near the surface. A velocity gradient results, the wind speed increasing steadily up to an altitude of about five hundred feet.

Circling flight wherein the bird rises upwind and descends downwind as is generally the observed case introduces the "Rayleigh Effect" described by Lord Rayleigh and investigated mathematically as well as practically by Idrac in his extended studies of the flight of the albatross, a bird similar to the frigate-bird of Florida but much larger. The "Rayleigh Effect" proves definitely that potential support is obtained by the bird circling in this fashion and if the wind velocity is sufficient (about fifteen miles per hour) this effect alone is enough to account for sustentation.

Finally, in addition to rising currents caused by thermal and other forces, we have an elaborate pattern of dynamic soaring flight possibilities where the bird or sailplane weaves its way in and out of wind currents of different directions and velocities storing and using energy to advantage in ways fairly well known and demonstrated.

Our study of soaring flight is far from complete. We must improve the contest glider and give it flexible wings—then do the same thing with large sailplanes. We cannot say that the superior flight of the soaring birds, here in Florida for example, is due to exceptional soaring conditions because gliding and soaring models perform no better here than they do up north where

we have no true soaring birds. We cannot blame the birds or the air—the fault rests with us and our soaring machines.

How to Build the Arrow Speedster

(Continued from page 9)

Flying

Since the model has a closed rear hook only 12, 16 or 24 strands can be used. Closer variation in power can be had by using odd sizes of rubber such as 7/64" or 3/32". Here is the procedure to put the rubber in. Cut off a length of rubber according to the number of strands to be used. Tie the two ends making it into a loop. Fold the rubber into half as many strands as the intended number. Get a piece of thin cord about 20 inches long and tie a small screw to one end of it. The screw serves merely as a weight. Now hold the body perpendicular and drop the screw in and over the rear hook. Next turn the body in the opposite direction, letting the string loop over the rear hook and also the screw drop out in the front. Tie one end of the rubber and the string together. Pulling the free end of the string will double the rubber over the rear hook. Untie the string while holding on to both ends of the rubber and hook it to the prop shaft. For the rear hook arrangement here, my thanks to young Buster Kaiser who was the first to be caught by the speed model craze.

Do not be alarmed by the extremely short rubber line. Even using 24 strands, more than 200 turns can be stored with the aid of a winder. This amount will zip the plane over 120 feet away.

Make sure that the thrust line is straight every way. The tail surfaces are not to be warped or adjusted in any case. Diving or climbing tendency is remedied by changing the wing incidence.

Avoid hitting the bare spots and soft landings!

Building the Midget "Cavu"

(Continued from page 18)

corner of the 1/4 inch square leading edge material, and, as soon as the ribs have dried thoroughly to the spar, glue the leading edge in position.

Next shape the trailing edge material to the proper form and glue in place. While this is drying, carve the tip outline from the 1/4 inch flat stock to conform to the drawing, glue in place and reinforce the forward piece with the diagonal brace as indicated. To join the two panels, cut the overlapping ends of the main spar and leading edge at an angle so that when fitted together the wing will show 3 inches dihedral at each tip. Lay one panel flat on your table and glue the center section of the main spar and leading edges together propping the wing tip of the other panel 6 inches up from the flat surface of the table. Allow this to dry, then bind the center section of the spar and leading edge with the silk thread and again coat with glue. Then carve the trailing edge cut-outs and glue them in the proper position. To complete the construction, the wing strut reinforcements are glued securely in place and the

Use SCIENTIFIC Gas Model Kits and Supplies for Best Results



THE STREAMLINER DESIGNED BY AMERICA'S GAS MODEL CHAMPION, MAXWELL BASSETT

Wing Span 6 ft., Weight (less motor) 2 1/2 lbs. Length 45". This new, many-featured Gas Model has stamped metal nose cowl, giving Big Plane appearance, with motor entirely enclosed and hinged hatch for accessibility. Flexible Wing Mounting, Crash-proof Landing Gear, High Wing Stability and Correct Dihedral for efficient gas model flight. Beautifully colored and decorated, correctly designed and capable of beautiful record flights. Kit includes ready made Balsa ribs, with notches cut for spars, together with all parts and materials required and full size detail Plans with every item of information necessary, including photographs, diagrams and instructions for installing any type gasoline engine.

**COMPLETE CONSTRUCTION KIT
POSTPAID OR AT YOUR DEALER**

\$4.95
Less motor and wheels

SPECIAL—ABOVE KIT INCLUDING 3 1/2 in. PNEUMATIC RUBBER WHEELS. Postpaid—less motor \$5.95



MISS AMERICA—7 ft.
A reliable, consistent flyer which repeatedly comes in among the winners. Complete kit including 3 1/2 in. pneumatic rubber wheels, finished 14" propeller and all other parts and Plans.
**AT YOUR DEALER \$9.50
OR DIRECT Postpaid less motor**



Wing Span 6 ft.
Weight (less motor)
2 1/2 lbs.

PRECISION BUILT WITH QUALITY FEATURES

In addition to holding the championship of France, this model has also won high honors in many American Contests. A consistent flyer and the most complete and easy-to-build model ever offered at this low price. Kit complete including full shock absorbing landing gear with special brackets, finished 14" propeller, and all parts and materials including full size plans with detail instructions.

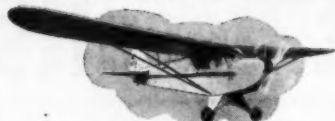
**AT YOUR DEALER \$6.95
OR POSTPAID Postpaid less motor**

COMPLETE KIT WITH 3 1/2" PNEUMATIC RUBBER WHEELS



MODEL "B"
BROWN JR.
3/8" bore, 1" stroke, 1200 to 10,000 R.P.M. 1/2 H.P. Bare weight 6 1/2 oz. Height 4 1/2". Runs 20 min. on 1 oz. fuel. Complete with tank, coil, and condenser. (Weight 11 1/2 oz.) Postpaid, \$21.50
GAS MODEL BALSA STRIP
Srl. Lengths:
1/2x1 1/2.....\$.02
1/2x1 1/4.....\$.04
1/2x1 1/2.....\$.06
1/2x1 1/4.....\$.08
1/2x1 1/2.....\$.10
1/2x1 1/4.....\$.12
1/2x1 1/2.....\$.15
1/2x1 1/4.....\$.18
1/2x1 1/2.....\$.20
1/2x1 1/4.....\$.22
1/2x1 1/2.....\$.25
1/2x1 1/4.....\$.28
1/2x1 1/2.....\$.30
1/2x1 1/4.....\$.32
1/2x1 1/2.....\$.35
1/2x1 1/4.....\$.38
1/2x1 1/2.....\$.40
1/2x1 1/4.....\$.42
1/2x1 1/2.....\$.45
1/2x1 1/4.....\$.48
1/2x1 1/2.....\$.50
1/2x1 1/4.....\$.52
1/2x1 1/2.....\$.55
1/2x1 1/4.....\$.58
1/2x1 1/2.....\$.60
1/2x1 1/4.....\$.62
1/2x1 1/2.....\$.65
1/2x1 1/4.....\$.68
1/2x1 1/2.....\$.70
1/2x1 1/4.....\$.72
1/2x1 1/2.....\$.75
1/2x1 1/4.....\$.78
1/2x1 1/2.....\$.80
1/2x1 1/4.....\$.82
1/2x1 1/2.....\$.85
1/2x1 1/4.....\$.88
1/2x1 1/2.....\$.90
1/2x1 1/4.....\$.92
1/2x1 1/2.....\$.95
1/2x1 1/4.....\$.98
1/2x1 1/2.....\$ 1.00
1/2x1 1/4.....\$ 1.02
1/2x1 1/2.....\$ 1.05
1/2x1 1/4.....\$ 1.08
1/2x1 1/2.....\$ 1.10
1/2x1 1/4.....\$ 1.12
1/2x1 1/2.....\$ 1.15
1/2x1 1/4.....\$ 1.18
1/2x1 1/2.....\$ 1.20
1/2x1 1/4.....\$ 1.22
1/2x1 1/2.....\$ 1.25
1/2x1 1/4.....\$ 1.28
1/2x1 1/2.....\$ 1.30
1/2x1 1/4.....\$ 1.32
1/2x1 1/2.....\$ 1.35
1/2x1 1/4.....\$ 1.38
1/2x1 1/2.....\$ 1.40
1/2x1 1/4.....\$ 1.42
1/2x1 1/2.....\$ 1.45
1/2x1 1/4.....\$ 1.48
1/2x1 1/2.....\$ 1.50
1/2x1 1/4.....\$ 1.52
1/2x1 1/2.....\$ 1.55
1/2x1 1/4.....\$ 1.58
1/2x1 1/2.....\$ 1.60
1/2x1 1/4.....\$ 1.62
1/2x1 1/2.....\$ 1.65
1/2x1 1/4.....\$ 1.68
1/2x1 1/2.....\$ 1.70
1/2x1 1/4.....\$ 1.72
1/2x1 1/2.....\$ 1.75
1/2x1 1/4.....\$ 1.78
1/2x1 1/2.....\$ 1.80
1/2x1 1/4.....\$ 1.82
1/2x1 1/2.....\$ 1.85
1/2x1 1/4.....\$ 1.88
1/2x1 1/2.....\$ 1.90
1/2x1 1/4.....\$ 1.92
1/2x1 1/2.....\$ 1.95
1/2x1 1/4.....\$ 1.98
1/2x1 1/2.....\$ 2.00
1/2x1 1/4.....\$ 2.02
1/2x1 1/2.....\$ 2.05
1/2x1 1/4.....\$ 2.08
1/2x1 1/2.....\$ 2.10
1/2x1 1/4.....\$ 2.12
1/2x1 1/2.....\$ 2.15
1/2x1 1/4.....\$ 2.18
1/2x1 1/2.....\$ 2.20
1/2x1 1/4.....\$ 2.22
1/2x1 1/2.....\$ 2.25
1/2x1 1/4.....\$ 2.28
1/2x1 1/2.....\$ 2.30
1/2x1 1/4.....\$ 2.32
1/2x1 1/2.....\$ 2.35
1/2x1 1/4.....\$ 2.38
1/2x1 1/2.....\$ 2.40
1/2x1 1/4.....\$ 2.42
1/2x1 1/2.....\$ 2.45
1/2x1 1/4.....\$ 2.48
1/2x1 1/2.....\$ 2.50
1/2x1 1/4.....\$ 2.52
1/2x1 1/2.....\$ 2.55
1/2x1 1/4.....\$ 2.58
1/2x1 1/2.....\$ 2.60
1/2x1 1/4.....\$ 2.62
1/2x1 1/2.....\$ 2.65
1/2x1 1/4.....\$ 2.68
1/2x1 1/2.....\$ 2.70
1/2x1 1/4.....\$ 2.72
1/2x1 1/2.....\$ 2.75
1/2x1 1/4.....\$ 2.78
1/2x1 1/2.....\$ 2.80
1/2x1 1/4.....\$ 2.82
1/2x1 1/2.....\$ 2.85
1/2x1 1/4.....\$ 2.88
1/2x1 1/2.....\$ 2.90
1/2x1 1/4.....\$ 2.92
1/2x1 1/2.....\$ 2.95
1/2x1 1/4.....\$ 2.98
1/2x1 1/2.....\$ 3.00
1/2x1 1/4.....\$ 3.02
1/2x1 1/2.....\$ 3.05
1/2x1 1/4.....\$ 3.08
1/2x1 1/2.....\$ 3.10
1/2x1 1/4.....\$ 3.12
1/2x1 1/2.....\$ 3.15
1/2x1 1/4.....\$ 3.18
1/2x1 1/2.....\$ 3.20
1/2x1 1/4.....\$ 3.22
1/2x1 1/2.....\$ 3.25
1/2x1 1/4.....\$ 3.28
1/2x1 1/2.....\$ 3.30
1/2x1 1/4.....\$ 3.32
1/2x1 1/2.....\$ 3.35
1/2x1 1/4.....\$ 3.38
1/2x1 1/2.....\$ 3.40
1/2x1 1/4.....\$ 3.42
1/2x1 1/2.....\$ 3.45
1/2x1 1/4.....\$ 3.48
1/2x1 1/2.....\$ 3.50
1/2x1 1/4.....\$ 3.52
1/2x1 1/2.....\$ 3.55
1/2x1 1/4.....\$ 3.58
1/2x1 1/2.....\$ 3.60
1/2x1 1/4.....\$ 3.62
1/2x1 1/2.....\$ 3.65
1/2x1 1/4.....\$ 3.68
1/2x1 1/2.....\$ 3.70
1/2x1 1/4.....\$ 3.72
1/2x1 1/2.....\$ 3.75
1/2x1 1/4.....\$ 3.78
1/2x1 1/2.....\$ 3.80
1/2x1 1/4.....\$ 3.82
1/2x1 1/2.....\$ 3.85
1/2x1 1/4.....\$ 3.88
1/2x1 1/2.....\$ 3.90
1/2x1 1/4.....\$ 3.92
1/2x1 1/2.....\$ 3.95
1/2x1 1/4.....\$ 3.98
1/2x1 1/2.....\$ 4.00
1/2x1 1/4.....\$ 4.02
1/2x1 1/2.....\$ 4.05
1/2x1 1/4.....\$ 4.08
1/2x1 1/2.....\$ 4.10
1/2x1 1/4.....\$ 4.12
1/2x1 1/2.....\$ 4.15
1/2x1 1/4.....\$ 4.18
1/2x1 1/2.....\$ 4.20
1/2x1 1/4.....\$ 4.22
1/2x1 1/2.....\$ 4.25
1/2x1 1/4.....\$ 4.28
1/2x1 1/2.....\$ 4.30
1/2x1 1/4.....\$ 4.32
1/2x1 1/2.....\$ 4.35
1/2x1 1/4.....\$ 4.38
1/2x1 1/2.....\$ 4.40
1/2x1 1/4.....\$ 4.42
1/2x1 1/2.....\$ 4.45
1/2x1 1/4.....\$ 4.48
1/2x1 1/2.....\$ 4.50
1/2x1 1/4.....\$ 4.52
1/2x1 1/2.....\$ 4.55
1/2x1 1/4.....\$ 4.58
1/2x1 1/2.....\$ 4.60
1/2x1 1/4.....\$ 4.62
1/2x1 1/2.....\$ 4.65
1/2x1 1/4.....\$ 4.68
1/2x1 1/2.....\$ 4.70
1/2x1 1/4.....\$ 4.72
1/2x1 1/2.....\$ 4.75
1/2x1 1/4.....\$ 4.78
1/2x1 1/2.....\$ 4.80
1/2x1 1/4.....\$ 4.82
1/2x1 1/2.....\$ 4.85
1/2x1 1/4.....\$ 4.88
1/2x1 1/2.....\$ 4.90
1/2x1 1/4.....\$ 4.92
1/2x1 1/2.....\$ 4.95
1/2x1 1/4.....\$ 4.98
1/2x1 1/2.....\$ 5.00
1/2x1 1/4.....\$ 5.02
1/2x1 1/2.....\$ 5.05
1/2x1 1/4.....\$ 5.08
1/2x1 1/2.....\$ 5.10
1/2x1 1/4.....\$ 5.12
1/2x1 1/2.....\$ 5.15
1/2x1 1/4.....\$ 5.18
1/2x1 1/2.....\$ 5.20
1/2x1 1/4.....\$ 5.22
1/2x1 1/2.....\$ 5.25
1/2x1 1/4.....\$ 5.28
1/2x1 1/2.....\$ 5.30
1/2x1 1/4.....\$ 5.32
1/2x1 1/2.....\$ 5.35
1/2x1 1/4.....\$ 5.38
1/2x1 1/2.....\$ 5.40
1/2x1 1/4.....\$ 5.42
1/2x1 1/2.....\$ 5.45
1/2x1 1/4.....\$ 5.48
1/2x1 1/2.....\$ 5.50
1/2x1 1/4.....\$ 5.52
1/2x1 1/2.....\$ 5.55
1/2x1 1/4.....\$ 5.58
1/2x1 1/2.....\$ 5.60
1/2x1 1/4.....\$ 5.62
1/2x1 1/2.....\$ 5.65
1/2x1 1/4.....\$ 5.68
1/2x1 1/2.....\$ 5.70
1/2x1 1/4.....\$ 5.72
1/2x1 1/2.....\$ 5.75
1/2x1 1/4.....\$ 5.78
1/2x1 1/2.....\$ 5.80
1/2x1 1/4.....\$ 5.82
1/2x1 1/2.....\$ 5.85
1/2x1 1/4.....\$ 5.88
1/2x1 1/2.....\$ 5.90
1/2x1 1/4.....\$ 5.92
1/2x1 1/2.....\$ 5.95
1/2x1 1/4.....\$ 5.98
1/2x1 1/2.....\$ 6.00
1/2x1 1/4.....\$ 6.02
1/2x1 1/2.....\$ 6.05
1/2x1 1/4.....\$ 6.08
1/2x1 1/2.....\$ 6.10
1/2x1 1/4.....\$ 6.12
1/2x1 1/2.....\$ 6.15
1/2x1 1/4.....\$ 6.18
1/2x1 1/2.....\$ 6.20
1/2x1 1/4.....\$ 6.22
1/2x1 1/2.....\$ 6.25
1/2x1 1/4.....\$ 6.28
1/2x1 1/2.....\$ 6.30
1/2x1 1/4.....\$ 6.32
1/2x1 1/2.....\$ 6.35
1/2x1 1/4.....\$ 6.38
1/2x1 1/2.....\$ 6.40
1/2x1 1/4.....\$ 6.42
1/2x1 1/2.....\$ 6.45
1/2x1 1/4.....\$ 6.48
1/2x1 1/2.....\$ 6.50
1/2x1 1/4.....\$ 6.52
1/2x1 1/2.....\$ 6.55
1/2x1 1/4.....\$ 6.58
1/2x1 1/2.....\$ 6.60
1/2x1 1/4.....\$ 6.62
1/2x1 1/2.....\$ 6.65
1/2x1 1/4.....\$ 6.68
1/2x1 1/2.....\$ 6.70
1/2x1 1/4.....\$ 6.72
1/2x1 1/2.....\$ 6.75
1/2x1 1/4.....\$ 6.78
1/2x1 1/2.....\$ 6.80
1/2x1 1/4.....\$ 6.82
1/2x1 1/2.....\$ 6.85
1/2x1 1/4.....\$ 6.88
1/2x1 1/2.....\$ 6.90
1/2x1 1/4.....\$ 6.92
1/2x1 1/2.....\$ 6.95
1/2x1 1/4.....\$ 6.98
1/2x1 1/2.....\$ 7.00
1/2x1 1/4.....\$ 7.02
1/2x1 1/2.....\$ 7.05
1/2x1 1/4.....\$ 7.08
1/2x1 1/2.....\$ 7.10
1/2x1 1/4.....\$ 7.12
1/2x1 1/2.....\$ 7.15
1/2x1 1/4.....\$ 7.18
1/2x1 1/2.....\$ 7.20
1/2x1 1/4.....\$ 7.22
1/2x1 1/2.....\$ 7.25
1/2x1 1/4.....\$ 7.28
1/2x1 1/2.....\$ 7.30
1/2x1 1/4.....\$ 7.32
1/2x1 1/2.....\$ 7.35
1/2x1 1/4.....\$ 7.38
1/2x1 1/2.....\$ 7.40
1/2x1 1/4.....\$ 7.42
1/2x1 1/2.....\$ 7.45
1/2x1 1/4.....\$ 7.48
1/2x1 1/2.....\$ 7.50
1/2x1 1/4.....\$ 7.52
1/2x1 1/2.....\$ 7.55
1/2x1 1/4.....\$ 7.58
1/2x1 1/2.....\$ 7.60
1/2x1 1/4.....\$ 7.62
1/2x1 1/2.....\$ 7.65
1/2x1 1/4.....\$ 7.68
1/2x1 1/2.....\$ 7.70
1/2x1 1/4.....\$ 7.72
1/2x1 1/2.....\$ 7.75
1/2x1 1/4.....\$ 7.78
1/2x1 1/2.....\$ 7.80
1/2x1 1/4.....\$ 7.82
1/2x1 1/2.....\$ 7.85
1/2x1 1/4.....\$ 7.88
1/2x1 1/2.....\$ 7.90
1/2x1 1/4.....\$ 7.92
1/2x1 1/2.....\$ 7.95
1/2x1 1/4.....\$ 7.98
1/2x1 1/2.....\$ 8.00
1/2x1 1/4.....\$ 8.02
1/2x1 1/2.....\$ 8.05
1/2x1 1/4.....\$ 8.08
1/2x1 1/2.....\$ 8.10
1/2x1 1/4.....\$ 8.12
1/2x1 1/2.....\$ 8.15
1/2x1 1/4.....\$ 8.18
1/2x1 1/2.....\$ 8.20
1/2x1 1/4.....\$ 8.22
1/2x1 1/2.....\$ 8.25
1/2x1 1/4.....\$ 8.28
1/2x1 1/2.....\$ 8.30
1/2x1 1/4.....\$ 8.32
1/2x1 1/2.....\$ 8.35
1/2x1 1/4.....\$ 8.38
1/2x1 1/2.....\$ 8.40
1/2x1 1/4.....\$ 8.42
1/2x1 1/2.....\$ 8.45
1/2x1 1/4.....\$ 8.48
1/2x1 1/2.....\$ 8.50
1/2x1 1/4.....\$ 8.52
1/2x1 1/2.....\$ 8.55
1/2x1 1/4.....\$ 8.58
1/2x1 1/2.....\$ 8.60
1/2x1 1/4.....\$ 8.62
1/2x1 1/2.....\$ 8.65
1/2x1 1/4.....\$ 8.68
1/2x1 1/2.....\$ 8.70
1/2x1 1/4.....\$ 8.72
1/2x1 1/2.....\$ 8.75
1/2x1 1/4.....\$ 8.78
1/2x1 1/2.....\$ 8.80
1/2x1 1/4.....\$ 8.82
1/2x1 1/2.....\$ 8.85
1/2x1 1/4.....\$ 8.88
1/2x1 1/2.....\$ 8.90
1/2x1 1/4.....\$ 8.92
1/2x1 1/2.....\$ 8.95
1/2x1 1/4.....\$ 8.98
1/2x1 1/2.....\$ 9.00
1/2x1 1/4.....\$ 9.02
1/2x1 1/2.....\$ 9.05
1/2x1 1/4.....\$ 9.08
1/2x1 1/2.....\$ 9.10
1/2x1 1/4.....\$ 9.12
1/2x1 1/2.....\$ 9.15
1/2x1 1/4.....\$ 9.18
1/2x1 1/2.....\$ 9.20
1/2x1 1/4.....\$ 9.22
1/2x1 1/2.....\$ 9.25
1/2x1 1/4.....\$ 9.28
1/2x1 1/2.....\$ 9.30
1/2x1 1/4.....\$ 9.32
1/2x1 1/2.....\$ 9.35
1/2x1 1/4.....\$ 9.38
1/2x1 1/2.....\$ 9.40
1/2x1 1/4.....\$ 9.42
1/2x1 1/2.....\$ 9.45
1/2x1 1/4.....\$ 9.48
1/2x1 1/2.....\$ 9.50
1/2x1 1/4.....\$ 9.52
1/2x1 1/2.....\$ 9.55
1/2x1 1/4.....\$ 9.58
1/2x1 1/2.....\$ 9.60
1/2x1 1/4.....\$ 9.62
1/2x1 1/2.....\$ 9.65
1/2x1 1/4.....\$ 9.68
1/2x1 1/2.....\$ 9.70
1/2x1 1/4.....\$ 9.72
1/2x1 1/2.....\$ 9.75
1/2x1 1/4.....\$ 9.78
1/2x1 1/2.....\$ 9.80
1/2x1 1/4.....\$ 9.82
1/2x1 1/2.....\$ 9.85
1/2x1 1/4.....\$ 9.88
1/2x1 1/2.....\$ 9.90
1/2x1 1/4.....\$ 9.92
1/2x1 1/2.....\$ 9.95
1/2x1 1/4.....\$ 9.98
1/2x1 1/2.....\$ 10.00
1/2x1 1/4.....\$ 10.02
1/2x1 1/2.....\$ 10.05
1/2x1 1/4.....\$ 10.08
1/2x1 1/2.....\$ 10.10
1/2x1 1/4.....\$ 10.12
1/2x1 1/2.....\$ 10.15
1/2x1 1/4.....\$ 10.18
1/2x1 1/2.....\$ 10.20
1/2x1 1/4.....\$ 10.22
1/2x1 1/2.....\$ 10.25
1/2x1 1/4.....\$ 10.28
1/2x1 1/2.....\$ 10.30
1/2x1 1/4.....\$ 10.32
1/2x1 1/2.....\$ 10.35
1/2x1 1/4.....\$ 10.38
1/2x1 1/2.....\$ 10.40
1/2x1 1/4.....\$ 10.42
1/2x1 1/2.....\$ 10.45
1/2x1 1/4.....\$ 10.48
1/2x1 1/2.....\$ 10.50
1/2x1 1/4.....\$ 10.52
1/2x1 1/2.....\$ 10.55
1/2x1 1/4.....\$ 10.58
1/2x1 1/2.....\$ 10.60
1/2x1 1/4.....\$ 10.62
1/2x1 1/2.....\$ 10.65
1/2x1 1/4.....\$ 10.68
1/2x1 1/2.....\$ 10.70
1/2x1 1/4.....\$ 10.72
1/2x1 1/2.....\$ 10.75
1/2x1 1/4.....\$ 10.78
1/2x1 1/2.....\$ 10.80
1/2x1 1/4.....\$ 10.82
1/2x1 1/2.....\$ 10.85
1/2x1 1/4.....\$ 10.88
1/2x1 1/2.....\$ 10.90
1/2x1 1/4.....\$ 10.92
1/2x1 1/2.....\$ 10.95
1/2x1 1/4.....\$ 10.98
1/2x1 1/2.....\$ 11.00
1/2x1 1/4.....\$ 11.02
1/2x1 1/2.....\$ 11.05
1/2x1 1/4.....\$ 11.08
1/2x1 1/2.....\$ 11.10
1/2x1 1/4.....\$ 11.12
1/2x1 1/2.....\$ 11.15
1/2x1 1/4.....\$ 11.18
1/2x1 1/2.....\$ 11.20
1/2x1 1/4.....\$ 11.22
1/2x1 1/2.....\$ 11.25
1/2x1 1/4.....\$ 11.28
1/2x1 1/2.....\$ 11.30
1/2x1 1/4.....\$ 11.32
1/2x1 1/2.....\$ 11.35
1/2x1 1/4.....\$ 11.38
1/2x1 1/2.....\$ 11.40
1/2x1 1/4.....\$ 11.42
1/2x1 1/2.....\$ 11.45
1/2x1 1/4.....\$ 11.48
1/2x1 1/2.....\$ 11.50
1/2x1 1/4.....\$ 11.52
1/2x1 1/2.....\$ 11.55
1/2x1 1/4.....\$ 11.58
1/2x1 1/2.....\$ 11.60
1/2x1 1/4.....\$ 11.62
1/2x1 1/2.....\$ 11.65
1/2x1 1/4.....\$ 11.68
1/2x1 1/2.....\$ 11.70
1/2x1 1/4.....\$ 11.72
1/2x1 1/2.....\$ 11.75
1/2x1 1/4.....\$ 11.78
1/2x1 1/2.....\$ 11.80
1/2x1 1/4.....\$ 11.82
1/2x1 1/2.....\$ 11.85
1/2x1 1/4.....\$ 11.88
1/2x1 1/2.....\$ 11.90
1/2x1 1/4.....\$ 11.92
1/2x1 1/2.....\$ 11.95
1/2x1 1/4.....\$ 11.98
1/2x1 1/2.....\$ 12.00
1/2x1 1/4.....\$ 12.02
1/2x1 1/2.....\$ 12.05
1/2x1 1/4.....\$ 12.08
1/2x1 1/2.....\$ 12.10
1/2x1 1/4.....\$ 12.12
1/2x1 1/2.....\$ 12.15
1/2x1 1/4.....\$ 12.18
1/2x1 1/2.....\$ 12.20
1/2x1 1/4.....\$ 12.22
1/2x1 1/2.....\$ 12.25
1/2x1 1/4.....\$ 12.28
1/2x1 1/2.....\$ 12.30
1/2x1 1/4.....\$ 12.32
1/2x1 1/2.....\$ 12.35
1/2x1 1/4.....\$ 12.38
1/2x1 1/2.....\$ 12.40
1/2x1 1/4.....\$ 12.42
1/2x1 1/2.....\$ 12.45
1/2x1 1/4.....\$ 12.48
1/2x1 1/2.....\$ 12.50
1/2x1 1/4.....\$ 12.52
1/2x1 1/2.....\$ 12.55
1/2x1 1/4.....\$ 12.58
1/2x1 1/2.....\$ 12.60
1/2x1 1/4.....\$ 12.62
1/2x1 1/2.....\$ 12.65
1/2x1 1/4.....\$ 12.68
1/2x1 1/2.....\$ 12.70
1/2x1 1/4.....\$ 12.72
1/2x1 1/2.....\$ 12.75
1/2x1 1/4.....\$ 12.78
1/2x1 1/2.....\$ 12.80
1/2x1 1/4.....\$ 12.82
1/2x1 1/2.....\$ 12.85
1/2x1 1/4.....\$ 12.88
1/2x1 1/2.....\$ 12.90
1/2x1 1/4.....\$ 12.92
1/2x1 1/2.....\$ 12.95
1/2x1 1/4.....\$ 12.98
1/2x1 1/2.....\$ 13.00
1/2x1 1/4.....\$ 13.02
1/2x1 1/2.....\$ 13.05
1/2x1 1/4.....\$ 13.08
1/2x1 1/2.....\$ 13.10
1/2x1 1/4.....\$ 13.12
1/2x1 1/2.....\$ 13.15
1/2x1 1/4.....\$ 13.18
1/2x1 1/2.....\$ 13.20
1/2x1 1/4.....\$ 13.22
1/2x1 1/2.....\$ 13.25
1/2x1 1/4.....\$ 13.28
1/2x1 1/2.....\$ 13.30
1/2x1 1/4.....\$ 13.32
1/2x1 1/2.....\$ 13.35
1/2x1 1/4.....\$ 13.38
1/2x1 1/2.....\$ 13.40
1/2x1 1/4.....\$ 13.42
1/2x1 1/2.....\$ 13.45
1/2x1 1/4.....\$ 13.48
1/2x1 1/2.....\$ 13.50
1/2x1 1/4.....\$ 13.52
1/2x1 1/2.....\$ 13.55
1/2x1 1/4.....\$ 13.58
1/2x1 1/2.....\$ 13.60
1/2x1 1/4.....\$ 13.62
1/2x1 1/2.....\$ 13.65
1/2x1 1/4.....\$ 13.68
1/2x1 1/2.....\$ 13.70
1/2x1 1/4.....\$ 13.72
1/2x1 1/2.....\$ 13.75
1/2x1 1/4.....\$ 13.78
1/2x1 1/2.....\$ 13.80
1/2x1 1/4.....\$ 13.82
1/2x1 1/2.....\$ 13.85
1/2x1 1/4.....\$ 13.88
1/2x1 1/2.....\$ 13.90
1/2x1 1/4.....\$ 13.92
1/2x1 1/2.....\$ 13.95
1/2x1 1/4.....\$ 13.98
1/2x1 1/2.....\$ 14.00
1/2x1 1/4.....\$ 14.02
1/2x1 1/2.....\$ 14.05
1/2x1 1/4.....\$ 14.08
1/2x1 1/2.....\$ 14.10
1/2x1 1/4.....\$ 14.12
1/2x1 1/2.....\$ 14.15
1/2x1 1/4.....\$ 14.18
1/2x1 1/2.....\$ 14.20
1/2x1 1/4.....\$ 14.22
1/2x1 1/2.....\$ 14.25
1/2x1 1/4.....\$ 14.28
1/2x1 1/2.....\$ 14.30
1/2x1 1/4.....\$ 14.32
1/2x1 1/2.....\$ 14.35
1/2x1 1/4.....\$ 14.38
1/2x1 1/2.....\$ 14.40
1/2x1 1/4.....\$ 14.42
1/2x1 1/2.....\$ 14.45
1/2x1 1/4.....\$ 14.48
1/2x1 1/2.....\$ 14.50
1/2x1 1/4.....\$ 14.52
1/2x1 1/2.....\$ 14.55
1/2x1 1/4.....\$ 14.58
1/2x1 1/2.....\$ 14.60
1/2x1 1/4.....\$ 14.62
1/2x1 1/2.....\$ 14.65
1/2x1 1/4.....\$ 14.68
1/2x1 1/2.....\$ 14.70
1/2x1 1/4.....\$ 14.72
1/2x1 1/2.....\$ 14.75
1/2x1 1/4.....\$ 14.78
1/2x1 1/2.....\$ 14.80
1/2x1 1/4.....\$ 14.82
1/2x1 1/2.....\$ 14.85
1/2x1 1/4.....\$ 14.88
1/2x1 1/2.....\$ 14.90
1/2x1 1/4.....\$ 14.92
1/2x1 1/2.....\$ 14.95
1/2x1 1/4.....\$ 14

PEERLESS GAS MODEL



TAYLOR CUB—6 Ft. Span

- CONTEST WINNER IN FLORIDA
TIME 0:11:23
- CONTEST WINNER IN MICHIGAN
TIME 0:15:44
- SCALE AND FLYING CONTEST WINNER IN IDAHO
- "BEST GLIDING MODEL I EVER BUILT"—
LETTER FROM ILLINOIS
- SELECTED FOR EXPORT TO ARGENTINE
BY PIPER AIRCRAFT MFGRS. OF THE TAYLOR CUB
- SOLD BY LEADING DEPARTMENT AND HOBBY STORES EVERYWHERE

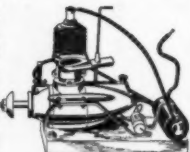
Complete kit contains all materials for constructing plane as pictured including full size detailed plans with pictures, clear notes and instructions. There is nothing else to buy except the motor. Special COLOR CODE helps identify the different strips of balsa and bass.

Complete Kit, less motor, with balsa wheels..... **\$5.50**

Complete Kit, less motor, with pneumatic rubber airwheels and single pole double throw snap switch **\$6.90**
(Add 50c to either Kit west of Denver or to Foreign countries.)

SYNCO ACE MOTOR

Streamlined miniature gas engine for model airplanes or boats. 1/5 h.p. 800 to 8000 r.p.m. Oilite bearings. Champion sparkplug. Complete with coil and condenser..... **\$15.00**



POPULAR PEERLESS KITS

10c MODELS—Fokker DVIII, Cessna C37, Rearwin Speedster, Waco Cabin, Red Bird R.O.G., Monocoupe 90A, Aeronca Low Wing, Stinson Taper Wing, Howard's DGA 8, Ryan S-T, Nieuport XVII C1.

25c MODELS—Cessna C-37, Kinner Sportwing, Monocoupe 90A, Rearwin Speedster, Taylor Cub, Heath Midwing, Stinson Taper Wing, Aeronca Low Wing, Fleet Trainer.

50c MODELS—Aeronca C-3, Hawker Monoplane, Fokker DVII, Taylor Cub, Junior Endurance, Monocoupe, Percival "Vega Gull."

ALSO—53" span Model of Taylor Cub for \$1.00. Peerless Senior Endurance—36" span, 26" length for \$1.45. Corben Super Ace with 54 1/2" span for \$1.95. And accurate 1/2" and 3/4" scale models of many popular ships.

Add 10c Postage to Orders for the Above Kits

SUPPLIES—A complete line of all supplies for gas or rubber powered models.

Write for 1938 Catalog No. 8

It will be ready early next month. We crave your indulgence until then. Orders for it will be filled as soon as ready.

Send 10c for your copy and free plan. Our reasonable prices will please you.

**THE PEERLESS MODEL
AIRPLANE CO.,**

3088 W. 106th St., Cleveland, Ohio

entire unit is sanded with fine sandpaper.

From the three view drawing, project the wing struts to their true length, carve each to a streamlined shape and trim the lower ends to fit flat against the side of the top longeron and the upper ends to fit flat against the strut bracings in the wing structure. Glue the struts in place on the fuselage, lay the completed wing on the struts and complete the final trimming of the struts to give the wing a one degree angle of incidence with respect to a zero stabilizer setting. Do not glue the wing in place until after both wing and fuselage have been covered.

Tail Surface

The construction of the tail surface is extremely simple; merely enlarge the drawing to full scale and glue the respective elements in position as shown. Construct the rudder and vertical fin as one complete unit, the horizontal stabilizer as one complete unit, and each elevator separately. The elevators are joined to the stabilizer by the simple aluminum hinge as shown in the full scale drawing, which is merely forced into the balsa and glued in place.

While the tail surface units are drying, mark the propeller block as shown and carve your propeller. Different propellers can be used with different engines. This particular design will give a 6 inch pitch propeller and the Elf engine turns it over at approximately 3200 r.p.m.s.

Covering and Assembling

The model is covered with ordinary Japanese tissue throughout, which, after being put on the framework, is sprayed with water, allowed to dry and then given three coats of pigmented dope. The color and trimming is, of course, to individual taste. The original model was colored a brilliant international orange, trimmed with black. For a high gloss finish, give the covering a final thin coat of lacquer. To assemble the model, glue the lower end of the rudder spar to station 8. Minor adjustments in rudder setting may be accomplished by inserting a pin in the leading edge through the stabilizer leading edge. Now when all the units are in place, including two battery cells in the battery box, check the balance of the fuselage by suspending from the diagonal wing strut. The fuselage should balance in flying attitude very close to station 3. Cut away the covering on the wing from the wing strut braces and glue the wing in place and the model is ready for the test flight.

Testing and Flying

The ship is easy to test because of its very convenient size and preliminary tests can even be run in the back yard. They consist of a series of successful pushes on the tail; each of increasing force until the model leaves the ground and glides for a short distance. Note carefully whether the model has a tendency to climb too steeply and then squash to the ground, or whether with even a moderately hard push it merely runs along the ground with the tail high. The ship should, with a push, approximately 18 m.p.h., leave the ground about 3 feet from your hand and climb from the momentum to about 4 feet, nose down smoothly and surely and glide in to hit squarely on both

wheels. For heaven's sake, be sure when you make this test that there isn't a fence 50 feet in front or else there will be some minor repairs. With these glide tests to start, we next proceed to the primary power tests.

Tie a string around the center section of the wing and have about 10 feet trailing; start the engine, and when it is running smoothly retard the spark until the engine is not delivering quite full power. Get behind the model, holding on to the string, and then run with it and allow the model to take off under its own power. Watch carefully for any tendency to stall or go into a steep bank in either direction. The take off should be steady and in a straight line. Make any necessary adjustments to the rudder and elevators until this is accomplished, then remove the string, put in a couple of drops of gas, offer a prayer to the model builders' god and let it go.

With reasonable care in construction and primary testing, it should climb to about 100 feet and fly for about three minutes and show a good, steady, but not too flat, glide when the engine cuts. After your first complete free flight has been accomplished and possibly some minor adjustments made, you will find that the performance is extremely consistent and will vary only at your own desire through changing the control surfaces.

You and Your Job

(Continued from page 15)

Frequently bad humor and gruffness are not directly the cause of business worry but perhaps it may be of personal nature. Usually the worst fault of any superior is caustic sarcasm which is expressed with a venomous attitude. This habit frequently can be found to obsess every one of us from time to time unless we guard against its outbreak. The good executive never lets invective get the best of his good humor. Men in executive positions invariably do not last long in a position of responsibility if they persist in the use of invective. Therefore the best policy in dealing with these types of individuals is to be firm and endeavor to overlook this shortcoming in human nature. Arbitration or contrariness gains little in this instance.

Perhaps one thing more than anything else that vexes the chief of some department is to have to constantly remind his immediate subordinates of some violation or infraction of the company policy. This policy is promulgated by the management of the concern and must be religiously followed. These rules have to be established because from time to time, certain employees habitually are prone to further their own interests by some infraction of company policy. The purpose of most company rules is to establish a code of fairness among the various workmen.

Another vital point to consider is the desirability of executing whatever work is assigned to you in accordance with the accepted and conventional practice. When entering the employ of a new firm this often imposes on the individual some period of transition from one method to another. The method of execution is unimportant when compared to the result. Some persons find it difficult to step into line in this respect,

"It's BUNCH the world over" for AIRPLANES • MOTORS • SPEEDBOATS

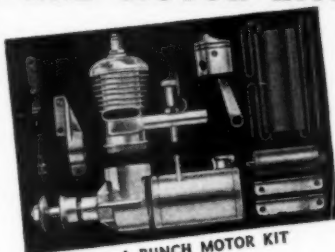
TODAY the Bunch Model Airplane Company stands first in the model industry with this famous line-up of motors, airplanes and speedboats. First because it is the constant aim of the Bunch organization to create, engineer, and perfect models of the highest standard for model builders the world over.

It is the daily task of the Bunch Engineering Staff, Production and Marketing Department, to see that Bunch Motors and models remain second to none as to performance, quality and individual character. Only an organization of this calibre is equipped with the personal and physical facilities to manufacture, distribute and unconditionally guarantee every single one of its products. Whether you patronize the Bunch Model Airplane Company directly, or conveniently purchase from our numerous dealers, you are constantly assured of the best the model industry has to offer.

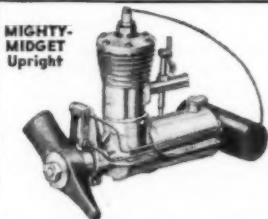
GAS MOTORS AND MOTOR KITS

For airplanes or boats, these piston ring equipped motors are the world's most powerful, light-weight model engines for their displacement. The Gwin-Aero, Mighty-Midget and Mighty Marine Kits, with instructions and mounting skids, assemble easily and require no special tools. Get power and performance for your money.

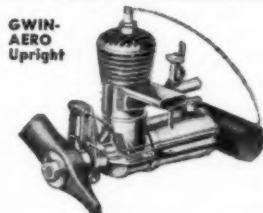
Specifications for all Bunch Motors: Bore, $\frac{7}{16}$ " stroke, $\frac{13}{16}$ "; bare wt., $\frac{6}{16}$ oz.; 1/5 h.p. at 5200 R.P.M.; $\frac{1}{4}$ h.p. at 8500.



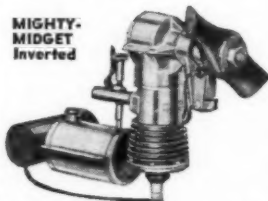
A BUNCH MOTOR KIT



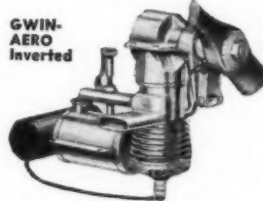
Assembled . \$14.00 — Kit . \$9.85



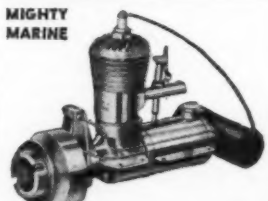
Assembled . \$17.50 — Kit . \$11.35



Assembled . \$17.25 — Kit . \$10.10



Assembled . \$18.25 — Kit . \$11.40



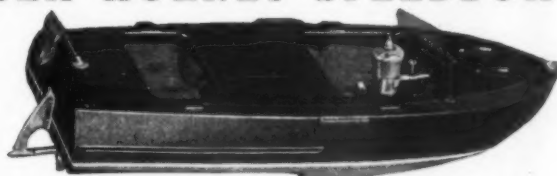
Assembled . \$17.75 — Kit . \$11.40



The new . . .
WARRIOR
Today's greatest motor value. Assembled, mounted and tested, only

\$12.00

SEA HORNET SPEEDBOAT



The Sea Hornet is the most thoroughly worked out, gas-powered speedboat kit today. Balsa construction, 24" long, 9" beam, speed 20 M.P.H. Comprehensive instructions and 20 step-by-step drawings make construction simple.

Master Kit—Complete with full-size drawings; ready-cut frames, sheer planks, motor mount beams, keel, knee, stem pieces; threaded drive shaft, coupling, rear strut, propeller, driving dog and stuffing box. Includes cement, dope, fabric and every part to build as illustrated.

Master Kit—Nothing to buy but the engine. **\$11.50**

Special Kit—All parts as in Master Kit, less only cement, dope, fabric, wiring and propeller drive. (Stuffing box and other fittings furnished) **\$7.50**

Plans and instructions only **50c**

RUBBER MODELS GULL FLOAT GEAR



Cadet Major—30-inch duration model. Fuselage design controls slip-stream. Kit, complete with rubber lube, carved prop, and freewheeler, postpaid **\$1.50**

Cadet Junior—20-inch wing. Rubber lube, carved prop, balsa wheels, freewheeler. Price, plus 10c postage. **50c**

Special—Both Kits, Cadet Major and Cadet Junior, postpaid. **\$2.00**

Super Scorpion—Cabin type. 20-in. Flying records of this rubber model established basis of the Scorpion Gas Model design. Flies in all kinds of weather, postpaid **\$1.00**

Equip your present ship with the Bunch Gull Float Gear. Any 3- to 6-lb. gas model easily operated over lakes or bays. Balsa construction, fabric covered. Weight, 12 oz.

Master Kit—All materials to build, waterproof and install on any airplane, postpaid **\$6.75**

Special Kit—Less chemicals, strut wire and fabric, postpaid. **\$3.00**

Plans and full instructions only, postpaid **25c**

SCORPION GAS MODELS



Wing span 57"
Length 41"
Weight 3 lbs.

Amazing performance of Scorpion Senior and Scorpion Major attested by thousands of flights.

✓ Check these features:

- Full-sized illustrated plans.
- $3\frac{1}{2}$ " standard pneumatic wheels.
- Liberal quantity cement and dope.
- "Autoklips" timer and all fittings.
- Finished and varnished propeller.
- Cut balsa wing and tail ribs and tips.
- Ready-bent music wire landing gear.
- Shaped, tapered wing spars and edges.
- Grade "A" selected hard balsa.
- Semi-shaped nose cowl.

Master Kit (as pictured) **\$10.50**

Standard Kit (less only timer, wiring, propeller, shaped cowl) **\$6.95**

Special Kit (less chemicals) **\$4.95**



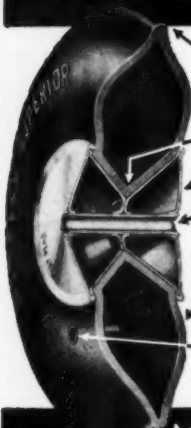
Order Senior for Inverted motor.
Order Major for Upright motor.
Plans, instructions only **50c**

BUNCH MODEL AIRPLANE COMPANY

5013 SOUTH HOOVER STREET, LOS ANGELES, CALIFORNIA, U. S. A.

British Agents: Model Supply Stores, Sales Depot and Showroom, 4 Stewart St., Deansgate, Manchester, 3.

MARPELL WORLD'S FINEST STREAMLINED GAS MODEL WHEEL



No other wheel has all these patented features:

- **Raised "Wear-Ever" Tread.** Narrow ground contact prevents "ground-looping" . . . assures streamlined shape at full air pressure.
 - **Full Diameter Pneumatic Cushion.** Fifty per cent more resiliency with shock absorption right to the very axle.
 - **New Patented Duralumin Hub.** Fabricated all-metal hub, of conical shape, saves weight and can not rim cut. Polished to a bright chromium finish.
 - **Long-Life Bronze Bearing.** Reduces friction . . . prevents wear and binding for entire life of wheel.
 - **Finest Grade Ebony-Finished Rubber.** Smoothly vulcanized to an even .072" wall thickness . . . black satin finish not affected by heat or cold.
 - **"Air-Check" Inflation Valve.** Holds full pressure indefinitely . . . valve is flush with tire . . . inflates with ordinary tire pump
- This new, no-leak, patented "Air-check" inflation valve is guaranteed against defect. Entirely original in design, this valve will not leak by outside manipulation or on landings, to regulate pressure, a simple adapter that fits any tire pump is furnished with each pair

Your choice,
4 1/2" diam., wt.
4 oz. pr.; or 3 1/2"
diam., wt. 3 oz.
pr., either size.
Per pair . . .

\$2⁰⁰

Post paid in U.S.
California Buyers
add 6c State
Sales Tax.

ORDER DIRECT FROM FACTORY

We have eliminated dealers' discounts and made possible this attractive price. Send postal money order. Please do not send checks.



MARPELL SUPERIOR PRODUCTS CO. 6406 Victoria Ave., Los Angeles, Calif.

while others learn to adapt themselves rather quickly. It is a good point to realize that orders must be obeyed before they can be imposed on others. The individual who can execute some specific order is better qualified to issue orders in event of an accession to an executive position.

Cooperation is a vital factor in the smooth running of any organization. Even though your fellow worker is prone to sluff his work, that doesn't excuse you from doing your share. There is no particular virtue in "coasting" along and defrauding your employer of his just due. Overlook the fact that your employer must make a substantial profit on your services in order to exist and to pay your wages. To how many does it occur that every employer must invest in his workmen a substantial sum which is covered in training and experience before your services can be of value to him? This does not mention the additional governmental taxes he must carry in order to employ you.

In the course of working, if you make an error, the right procedure is to acknowledge the same. A resort to subterfuge or an arbitrary attitude does not correct the error. The point to realize is that making the error or who did it is unimportant. The important thing is to rectify the error if possible. In engineering work such things constantly occur and in many cases are unavoidable. It is well to consider that in some positions, taking and absorbing the blame is part of your job.

The man who continually harbors the idea that he is getting a raw deal is suffering from a personal complex. Did it ever occur to you that your employer may think the same about you?

Personal complexes have no place in modern industry. Do not be afraid to accept responsibility. The man who wishes to advance must constantly be on the alert to accept responsibility. Even though your own immediate task may bore you, bear in mind that you offered to take a laborious interest in your employer's business when you sought out the job. If you do not live up to this agreement, then you could be

accused of accepting compensation on false pretenses, figuratively speaking. In many instances those who do the greatest work of difficult nature are not always the best paid. This condition will always persist, and it is part of the law of the survival of the fittest. If conditions are unbearable in a mental way, then the only remedy is to seek a position somewhere else.

When working in a collective group it is unfair to expect certain privileges such as off days, etc., or any other excuse to shirk your job. It is obvious that everyone can't have this privilege or else no work would be achieved. Confining one's self to the routine of the department is no big task. It is purely mental with an air of willingness to adapt one's self to the job on hand. In every working group there will always exist those who seek special privileges. Asking your superior for special privileges places both you and him on the "spot" as expressed in the vernacular of the underworld. No doubt he understands your desire and wants to give you permission but yet it is difficult to refuse you. This is mentioned to show that after all certain discipline must prevail in every organization. In an analysis, one will find that individuals who seek special privileges on flimsy excuses usually lose out.

On the legitimate stage they have an axiom about the play going on. In aviation there exists a similar need. During the days of the old air mail system the expression, "the mail must go through," was a paramount factor in establishing the present day service. This axiom could be applied to modern aircraft industrial plants. In fact, more of the spirit of the "mail" going through would be a welcome relief to worried employers in this field who are hampered by strikes, labor dissatisfaction, sabotage, and what not. Why not carry the "message to Garcia" yourself in regard to your job? If you do, you'll find it very worth while.

An American View of German Model Aviation

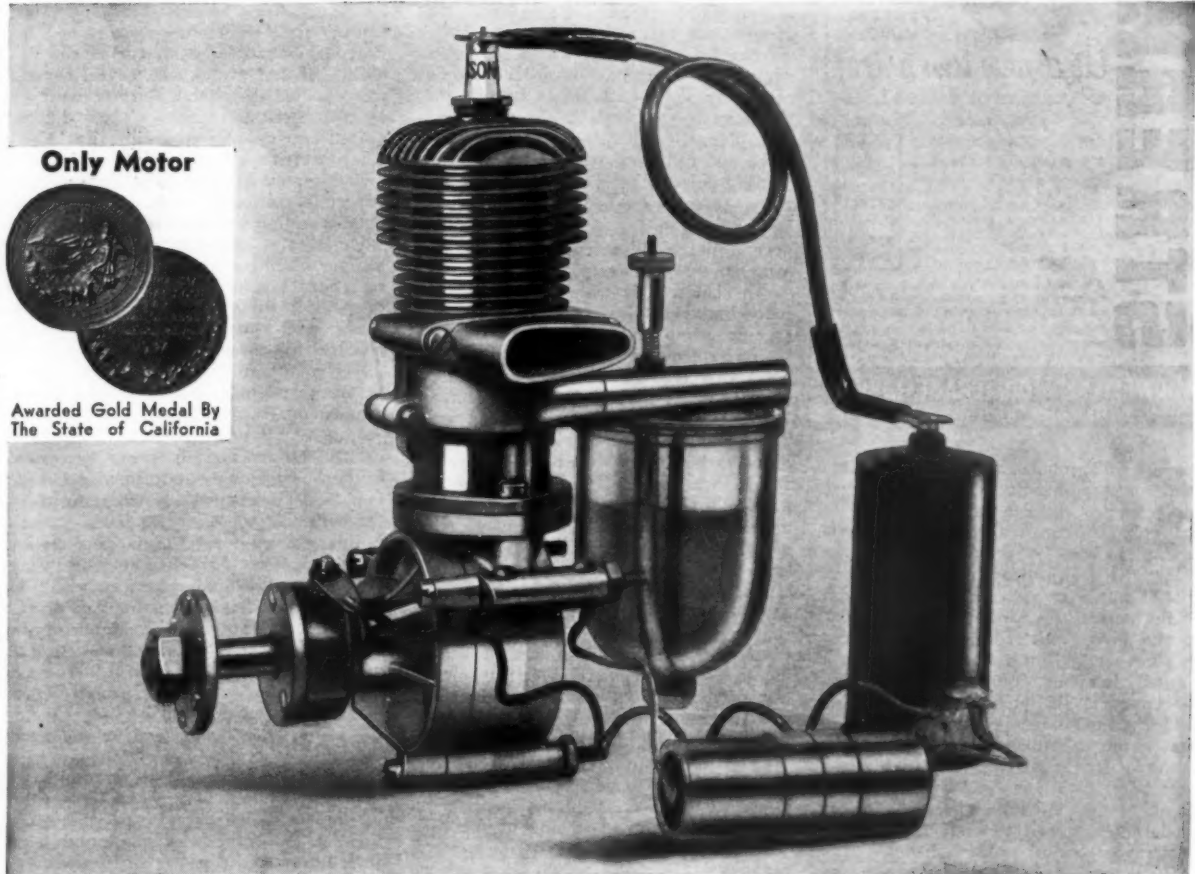
(Continued from page 7)

desired sections, curves and bends. It is doubtful if metal will ever be used extensively as the cost of the equipment runs upward of \$10.00 beside requiring considerable skill and time. It is quite possible that it will be taught in schools as well as used by those who enjoy making models for the sake of construction and not flying. There is no need of bringing in the repair question of metal models which is of paramount importance to contest flyers.

The so-called "Jofros Zellenleimplatte" material described by Mr. Maier in the October issue is primarily intended for insulation purposes. Its appearance can be likened to cream-colored marshmallow with fairly fine pores but large holes here and there. Dubbed as "synthetic balsa" in London, it has no grain whatsoever and it tears fairly easily like sponge. In its present stage its value is mostly in filleting and rounding parts of the model. Shaping is very easily accomplished by wetting the working portion and rubbing off the surplus with fingers. Although it has been tried for ribs, the result seems a bit weak. If a method could be found to impregnate this froth-like gelatine mixture with celluloid and compress it while in a plastic stage, the material should be suitable for as many uses as sheet balsa. It should not be used for main stress members.

From the aerodynamical design viewpoint the German designs are in a class by themselves in that they are not seen in places outside of Germany. However, the large hand-launched gliders so popular with German boys for such a long time influence the design of rubber jobs. This, plus the fact that past contests considered distance for winning has led to a typical design which to the "high climber addicts" would seem old-fashioned: Full length rubber, small dihedral (about 5% of span under each tip as compared to

OHLSSON AGAIN SCOOPS THE MINIATURE FIELD . . .



Only Motor



Awarded Gold Medal By
The State of California

WITH A TRANSPARENT FUEL TANK!

(Patent granted D-107448. Other patents applied for.)

The transparent, unbreakable fuel supply tank on the new Ohlsson Gold Seal Miniature Motor takes all the guesswork out of fueling—now you can see how much fuel you have—just one more example of why Ohlsson Miniatures are tops with model fans the world over. Ohlsson Miniatures are the finest motor that money and experience can build—every part is machined to rigid specifications—every motor is pre-tested on specially designed blocks—every Ohlsson Motor is a Champion from the first turn of the “prop”—that’s why model builders everywhere enthusiastically endorse Ohlssons. Order yours today! Complete, as shown above (actual size).....

\$1850

BUILD THE OHLSSON PACE MAKER CALIFORNIA Champion!

Wing spread 68 1/4". Weighs only 3 1/2 lbs. Winner of every major model meet in California during 1937. Build this sensational performer yourself with the Pace Maker Kit. Complete with everything except motor. Price.....

\$1000

COMBINATION OFFER

Ohlsson Gold Seal Motor complete with new transparent fuel tank and the Pace Maker Kit, ready for complete assembly.....

\$2500

MAIL THIS COUPON TODAY!

OHLSSON MINIATURES, 630 North Alvarado, Los Angeles, California
Rush me one factory assembled, tested and guaranteed OHLSSON Gold Seal Motor. I enclose money order for \$18.50.
Send me OHLSSON Pacemaker KIT. I enclose money order for \$10.00.
Send me your Combination Offer—I enclose money order for \$25.00.
Send me complete Pacemaker Plans. I enclose \$1.00 money order. If I order KIT later I understand this dollar will be credited toward the purchase price.

NAME

ADDRESS

OHLSSON FOREIGN DISTRIBUTORS AND DEALERS

AER-O-KITS (SHEFFIELD)
Hanover Works
135 Scotland St.
Sheffield 3, England

BOND'S O'EUSTON ROAD, LTD.
254 Euston Road
London, N.W. 1

R. STAB
35 Rue des Petit Champs
Paris, France

ESKADER
Narvaplaset
Cumshornsgatan 8-9
Stockholm, Sweden

HONOLULU PAPER CO.
Honolulu, T. H.

MODEL AIRCRAFT (PTY.) LTD.
P.O. Box 1906
Capetown, South Africa

(OHLSSON)
MINIATURES

630 NORTH ALVARADO STREET
LOS ANGELES, CALIFORNIA

STREAMLINED **BALSA WHEELS**
FOR YOUR **GAS MODEL**
OR **RUBBER POWERED MODEL**

At a new low price!
•Streamlined or Balloon types...
•Non-slipping rubber tread prevents
denting and scorching

4 3/4" DIA. RUBBER... \$1.00 Postpaid	SEND 5¢ IN STAMPS FOR OUR LATEST CATALOG DEALERS WRITE
3 1/2" DIA. RUBBER... .75 Postpaid	
2" DIA. RUBBER... .50 PER PR.	
1 3/4" DIA. PLAIN... .40 PER PR.	
1 1/2" DIA. PLAIN... .37 PER PR.	
1" DIA. PLAIN... .35 PER PR.	

4 3/4" WHEELS HAVE 1/8" AXLE HOUSING 3 1/2" WHEEL HAS 3/8" AXLE HOUSING. CHOICE OF BALLOON OR STREAMLINED WHEELS AT SAME PRICE LISTED

ORDERING: SEE YOUR DEALER OR SEND DIRECT.
MIN. ORDER 25¢ ADD 10¢ POSTAGE ON ORDERS
UNDER \$1.00 OVER \$1.00-10% IF IN MO ADD SALES TAX

MIDWESTERN MODEL CRAFT HOBBIES
5834 WOODLAND AVE., KANSAS CITY, MO.

our 10% minimum), small tail surfaces and a prop which has a neat appearance but a bit too much area concentrated at the hub. Although this prop design is logical in that it provides extra area where the prop is least efficient, the fact that it works at such an angle that part of the normal lift force breaks up into a torque force which does not help very much especially on a design with such a limited inherent countertorque factors. To complete the picture, the synthetic rubber does not possess the elasticity of the natural rubber; consequently the power or torque curve is very high at the initial burst with a rapid drop to a low point. I might mention here that every model had excessive washout which in part made up for the low dihedral.

On a tour of the field in the company of Major Schröter, we approached the spot where the glider pilots were training for airplane towing. In one corner a two-seater glider was taking up the visiting officials to give them a taste of glider flying. The major asked me how I would like a top. Having had almost every means of launching but plane tow I naturally bubbled all over with enthusiasm. The matter was soon arranged and I was on my way up on the nose of a Granau two-seater, feeling every move my pilot made to coordinate with the power plane. It took us 10 minutes to reach 2,000 feet and 5 minutes to come back to earth, but in those five minutes I was through with his little bag of tricks. It seemed that way by the time the pilot was through with his little bag of tricks.

While I kept my eyes open for technical developments the major explained the present model organization set-up. It seems that before the present regime became effective the model game was carried on by individual clubs all over the country, just as in America. But with the reorganization of the country as a whole, the model clubs came in for their share.

A detailed account of how reorganization came about and its effect on the nation, is for the pen of the historian. Let it suffice here that Germany is now segregated into sixteen districts to take the place of the small and large principalities or states which were held to hinder progress of the country by their slow parliamentary procedure. This sixteen district idea is held for all activities of wide scope. There is only one national club of whatever nature it may be and it has sixteen branches from which extend as many sub-branches as are needed for that particular district. It might be said that Germany is now organized on the pyramid plan, Berlin being the controlling office and radiating from it the sub-controlling points.

The aviation portion which includes all phases of aviation activities outside of pure military is incorporated under the name of *Nationalsozialistischen Fliegerkorps*. Under this new arrangement the individual clubs lost their identity as a specific group and are now listed under their city group. From an efficiency viewpoint this is an excellent plan and especially under the German idea of creating a large number of airminded men. To us this scheme might smart too much of militarism, but the Germans themselves admit that many of their ideas are definitely for their own good and wholly unsuitable elsewhere. On the whole, this movement has caused a widespread knowledge of model building since it is taught in all schools. In fact there are three schools just devoted in giving lessons to regular teachers who upon their return to their schools teach model building to their youngsters. Well, whatever may be the aim, the boys undoubtedly enjoy the hobby for its own sweet sake, so to speak.

Later in the afternoon the expected call came from the Dulmen's station master to announce the arrival of the Englishmen. We picked them up in one of the cars placed especially at our disposal and one other volunteer. It wasn't long before we were together talking about the good time we had had in London. The visiting Englishmen were Harry York and J. C. Smith, the men who undoubtedly deserve the most credit for making the Wakefield competition such an international classic. Also Mr. A. F. Houlberg, vice president of the S.A.M.E. and one of the real early model builders who still thinks it is the finest sport ever, and Mr. Kiel whose only regret seems to be that he did not get into the game sooner than he did.

That evening we had supper at the field restaurant and when the meal checks were paid the Scotchman in me got a pleasant shock. He found out that we were all guests of the N.S.F.K. in the full sense of the word. Free meals, free auto, free hotel accommodations, free snacks and what have you. To make it perfect, Major Schröter's sole job was to see to our comfort and make sure that we met all the important people as well as be admitted to all the enclosures. The major speaks excellent English and holds a tender spot for Englishmen ever since the war in which he spent three years as prisoner of war in London.

Saturday continued with perfect summer weather and by the time we arrived on the field the contest was already in progress with the gas event coming first. Here and there could be heard the sudden burst of motor life only to be stilled as the contestant tried a new adjustment. Most of the motors were of one manufacture which is still on a small scale. An examination of the motors showed low compressing and rough mixing valve. Consequently the motors were rather undependable and so handicapped the flyability of the model. However, several motors did perk good and we watched several check ten minutes after the required two minutes of motor run. Considering that the past year ushered in gas model contests for the first time we can expect several new motors of typical German precision in the near future.

During the course of the meet we met all the members of the Wakefield team including Mr. F. Alexander who heads the model division of the N.S.F.K. in Berlin and who was the director of the contest. Then we had the pleasure of meeting Mr. Lippisch himself. He spends his days designing new ships for the government in Darmstadt and has postman's evenings by building models. To us he is mostly known for his many successful tailless power ships and gliders. On the field he demonstrated a working ornithopter with just the wing tip portion of an ordinary wing doing the flapping motion for propulsion. In a nutshell, he is one of the few men who has every bit of aerodynamical theory on his finger tips. Also Mr. Horst Winkler, editor of the "Modellflug," the organization's official model magazine. He is considered the top notch model man in the country. And many others who are taking model building seriously as being good for the country.

The R.O.W. event had an honest to goodness canvas tank which was filled by the local fire department. Somehow the R.O.W. entry was small and those that did enter did not seem to have very much experience in this line. For that matter most of the builders throughout the world are in similar circumstances.

SCALE-CRAFT FANS

Cowling Special

We will turn any 3/4" scale cowling (also, any size cowling between 2 1/2" and 4") to your order. These cowlings will be hand-turned from a select grade of balsa to a wall thickness of 1/4", unless otherwise specified; beveled to a thin wall thickness at trailing edge, sanded to a smooth finish, semi-finished inside,—suitable to use with celluloid motors. When ordering give cross section drawings with all dimensions.

35¢ each postpaid

TISSUE SPECIAL

Scale-Craft Japodex—a brand new de luxe scale model tissue hitherto unused. Scale-Craft Japodex is much stronger, will stand more sand papering, and dope smoother than regular tissues. Proved by actual service.

2 sheets (20" x 30").....10 Postpaid
6 sheets (20" x 30").....25 Postpaid

Dealers and clubs write for prices.

SCALE-CRAFT CO.

"Model Specialties"

P. O. Box 147

Westfield

Massachusetts

A time of 28 seconds by Mr. Menzel of Dresden won the event.

The contest itself was ably managed with a sufficient number of officials and many starting points. The spectators of whom there were many were kept behind the ropes which were strung fairly close to the models.

While we meandered back and forth we kept our eyes open for new ideas which we could use to advantage. On the model itself we could not find anything special which would supersede our own gadgets. The gas props did have a small pulley like unit behind the prop nut to start the motor with a string like we do with out-board motors. Also a self starter for the motors. There were two designs in evidence. One was a cylindrical affair with torque power enclosed and under control of a trip. Power was very light, made up of several springs. The prop connection was of fork type which free-wheeled if the motor started. The other design was of gear and rack combination. Just imagine two guide rods spaced so as to form sides for "H" on whose center bar the gear was placed. The rack was movable up and down and on the downward stroke engaged the gear which was connected with the prop as in the first design. Also the booster batteries were the home-made storage type.

The gas models themselves must have taken considerable time in construction as they were of plywood and spruce strips which had to be glued together with casein cement. It was surprising how well the plywood was worked under difficult conditions especially on some scale gas jobs. On the whole, the first day moved rather slowly since motors were sulky and the R.O.W.s liked the water.

That evening they had what they called a "comradeship meeting." It opened with a serious note by the local leader and reminded the boys of their duty to their country. Then stirring songs of which there are many now in Germany. Encouraging words from the corps leader, Generalleutnant Christiansen, better known to us as the commander of the giant DO-X. Mr. Alexander gave a complete picture of the Wakefield contest including the spiralling motion of the high climbers from America.

Sunday was really the day of the contest as the rubber fuselage jobs were up. From early morning until 2:30 the air was filled with them. Somehow the performance was as we had expected from the previous examinations. The sudden high power, high pitch props, small tail surfaces combined with low dihedral, made spiral adjustments very tricky and fine. The veterans got their ships off to good starts and we could not help but admire some of them as they soared easily on the ground currents. The youngsters were the ones who suffered mostly from spiral instability, and the models performed the characteristic banking dives. Others swung high into a stall from which recovery was long because of small stabilizer and long rubber moment. The high climbers simply weren't there with the exception of Mr. Haase who used his Wakefield model modified to rules and a bit of extra dihedral. He placed high

Sensational MODELCRAFT Offer

**SOGARD
PROPELLERS**

49c



THE NEW 1938 SCOUT

A Big Ship For Powerful Flying Powered by Midget, Denny-mite, Cyclone, Ohlsson or Brown engine. The Scout is new throughout with 60" tapered Clark Y wing, new design, and parts with latest improvements. Kit contains formed landing gear, ready-cut ribs, formed face plate and cowl, switch, hook up wire, cement, dope, silk, full sized plans and Voigt air wheels. Only **\$7.25**

Special money saving deal: Kit, Timer and Ohlsson engine..... **\$25.00** ~~SAVE \$2.25~~

Same kit with bamboo paper and rubber Donut wheels.....**\$4.85**
Dry Kit: No cement, dope, covering or wheels.....**\$3.75**

THE PACIFIC ACE



This graceful, high-flying, light-weight ship is very popular this season. Kit is fully equipped, including ready-cut ribs, beveled trailing edge and real silk. Power with Brown, Ohlsson, Cyclone, or Denny-mite engine. Weight ready to fly, 3 lb. 4 oz. Wing span 60", standard kit..... **\$8.50**

Price prepaid in U. S. A.
Same kit less air wheels, silk, cement & dope.....**\$4.75**

THE FALCON



POWER WITH BRAT, TROJAN, HUSKY, ELF OR CHUNN ENGINE. Boys, here is the plane for you. Easy to build, and flies smooth as a Gull. 38" tapered wing. Kit complete with cement, dope, wheels, covering, printed ribs, formers, etc. **\$1.50**

Be sure to check coupon for "Knowing How," a Free book to model plane builders.

Deluxe kit with Traxler air wheels and silk cover- **\$2.95**

MODEL CRAFT Dept. A. 7306 Vermont Ave.
LOS ANGELES, CALIF.

☐ Send me booklet on "Knowing How"

☐ Send me Modelcraft price list on planes, engines and supplies. We offer a complete stock to fit every builder's need.

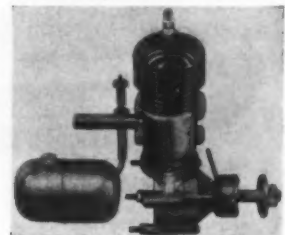
ORDER

NAME ADDRESS

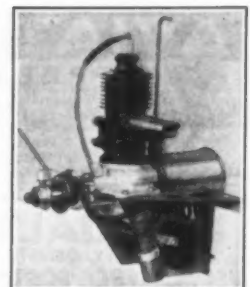
CITY STATE

THE LEADING SUPPLY HOUSE OF THE WEST

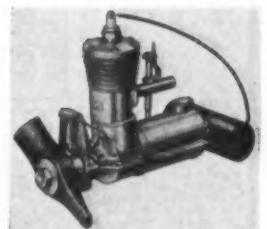
9", 12", 13", 13 1/2", 14"
Yes, the same high-quality Sogard Propeller is now sold at an amazingly reduced price. It is the prop with true pitch, accurate balance, maximum thrust and minimum torque. Take advantage of this sensational offer. Order today!



1938 OHLSSON ENGINE
1 1/2 H. P. \$18.50
A high-powered unit



DENNYMITE—1 1/2 H. P.
\$16.50
Especially adapted to the Pacific Ace



MIGHTY MIDGET
Kit \$9.85
Especially adapted to the Scout

**WRITE FOR FREE
BOOKLET**

"Knowing How" is the builder's manual for guiding model plane construction, condensed for easy reference. Free with coupon.

CLIP AND MAIL

two strips of 1/32 square and bending them around a soldering iron to a one inch diameter circle. Then cement a one inch strip 3/64 square inside the wheels. Attach wheels to landing gear and then cement to fuselage 3 3/8" from nose of fuselage, slightly leaning forward as shown. The nose block is made from two pieces of laminated 1/32 sheet, to fit nose when finished. The rear plug is made in the same manner as the nose plug.

Propeller

The prop is saved for the last piece of work, which is the whole success of this ship. I spent a week off and on carving this prop. It has a perfect airfoil as shown on drawing. It is carved from a block 1x1 1/2x12. A four and one-half pound grade wood is used.

Adjusting and Flying Model

Assemble the model and glide it until it floats. When that is done make a loop of 1/16 flat brown rubber tied in a fifteen inch loop. Test the model with two hundred turns and then gradually add more power and slack when model is perfectly adjusted. I would advise using 5/64 flat rubber when flying this model in winter tournaments. Remember this model was flown in perfect weather with the temperature at 100 degrees, and the model was perfectly adjusted.

Now you really have a contest winner, that is, if you have spent the time that is needed for a record breaking ship. Go to it and many happy landings.

Build and Fly This Miniature Monocoupe

(Continued from page 25)

the correct shape. Make the fillet oversize to allow for the contracting cement. After sanding, wood filler may be used to fill the pores of the mixture.

Wing and Tail Surfaces

In building the wing, have an absolutely flat surface to build your wings on, so that they will be free from warps. After cutting the wing spars to shape, slide the ribs into place and cement. Cut the leading and trailing edges to shape and cement in place. The wing tips should be added now and after moistening sheet balsa of the correct size, apply to the leading edge of the wing. This sheet covering may be held in place with pins until it is dry enough to cement. Sand the entire unit with fine sandpaper and any ribs that have been cemented in place a little out of position should be sanded down. Make the struts out of the correct size of sheet balsa, and while they are drying, proceed with the stabilizer and rudder. These parts are very simple and the only thing of great importance is to keep them from warping while under construction. After covering the entire model, spray with water, and set aside while the tissue tightens. The wing and tail surfaces should be pinned down to a flat surface while the tissue is drying so that they will not warp. Do not remove the wing from the flat surface too soon, because the underside of the wing may still be wet, and will warp.

After inserting two loops of 1/8" flat rubber into the model, give it a few test glides. If it dives, turn the movable stabilizer very slightly upwards. If it continues to dive, turn the stabilizer upwards a bit more. On the other hand, if it stalls, move the stabilizer down the correct amount. If the model performs satisfactorily with a few turns in the rubber motor, increase the amount until you are sure it will fly well under full power. If you desire to see a scale model that really climbs, put an extra loop of rubber in and lubricate it with rubber lubricant.

Frontiers of Aviation

(Continued from page 13)

Navy boats now in service.

The Consolidated Aircraft Corporation made history when they launched their new giant air battleship recently in the bay between Lindbergh Field and the Navy's great North Island Naval base. The huge four-engined flying boat rose gracefully off the water and passed its maiden test flights successfully. More details of this airplane follow later in this article.

In the pursuit plane field tests have been conducted on the Curtiss Company's latest creation, the XP-37, and thirteen of them have been ordered for further service tests. (Incidentally it has also been rumored that 13 Bell twin-engined fighters are also on order for service tests.) The XP-37 is an adaptation of the P-36 pursuit equipped with a 1,000 hp. Allison engine and the Curtiss Company claims that this pursuit is the fastest in the world. The ship is of very clean design, as are nearly all V 12 powered airplanes today. There is no radiator apparent on the ship and only a small air scoop on the side does most of the cooling. Different from the usual procedure of having the General Electric turbo-supercharger on the side of the fuselage, it is located in the belly of the fuselage. Up forward is one of the new electrically controlled full feathering Curtiss propellers with three blades and a large spinner. The pilot sits just in front of the tail fin. The tail wheel retracts as well as the main landing gear, and now we must await Seversky's creation with an Allison engine.

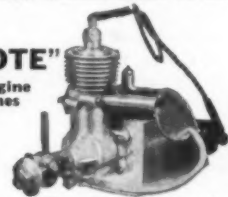
Other ships under test have been the Brewster and Grumman Navy fighters. Lockheed's cargo plane for the Army was being put through its paces when word came that the Army had almost completed tests on their new subsonic plane, and that it had recently made a record flight of 220 miles in 38 minutes, giving it a top speed of 350 m.p.h. over the measured course at altitudes between 19,000 and 21,000 feet. Army designation of the plane is XC-35.

The Lockheed cargo plane, which will compete for a possible 100-plane Army contract, has been built according to Army specifications and resembles the Lockheed "14." The wing spread is 65 ft. 6 in., length 44 ft. 3 3/4 in., top speed 250 m.p.h., cruising speed 227 m.p.h., and the range is more than 2,000 miles. 850 hp. Hornet engines power the airplane.

The "IMP" Gas Engines

THE only miniature gas engines having one piece cast aluminum crankcase and cylinder, eliminating leaky gaskets and assuring maximum compression and low gas consumption. The four-point radial mounting permits complete control of thrust and torque. Rotary valve type with high speed bronze bearings, streamlined exhaust and only four moving parts.

The
"INTERMOTE"
Air Cooled Gas Engine
for Model Airplanes
(Illustrated)



"WATER NimpH"

Water Cooled Gas Engine for Boats and Radiator Equipped Model Airplanes

Bore 51/64", Stroke 53/64". Block tested and certified H.P.—0.190, R.P.M.—320 to 11966 according to propeller or fly wheel use.

The "INTERMOTE"—For model airplanes from 3 to 8 ft. wingspan. Weight, bare 6 1/2 oz. complete 10 1/2 oz., equipped with spark plug, coil, condenser, fuel tank and aluminum engine mounting. Postpaid..... \$15.00

The "WATER NimpH"—Mounted on aluminum stand, equipped with spark plug, coil, condenser and fuel tank. Postpaid..... \$16.50

(These motors made by American engineers and craftsmen who have sacrificed mass production for perfection)

SPECIAL COMBINATIONS

Direct Orders Only

"INTERMOTE" gas engine with REARWIN SPEED-STER kit, extra 13" G.A. gas prop (value \$1.00) and Knip Timer (value \$1.75). Complete P.P. \$20.00
S-2 motor and REARWIN Kit—complete P.P. \$8.50
SA-2 motor and REARWIN Kit—complete P.P. \$10.00

International FLIGHT TIMER

To insure absolute control of your gas model flights. Made in three types:

A—From 0 to 55 sec.
B—From 0 to 5 min.
C—From 0 to 20 min.

Weights—A and B, 2 1/2 oz.; C, 4 oz.

(Type C for large Planes and Boats)

Vibrationless. Accuracy is assured as they have been made by foremost expert American clock and watch makers. \$2.00

For contest or regular flights. Each Postpaid..... \$2.00

The "TRU-DETAIL" FLYING SCALE MODEL of the GRUMMAN S.F. 1



Wing Span 21 3/8"

The only Kits using Paulownia and Balsa wood for construction. Each kit contains 230 completely finished parts of Balsa, Paulownia and Metal. The 70 ribs for upper and lower wings are finished, formed and notched. 2 propellers, one for flying and the other scale for exhibition. Nose cowling, nose piece plug, scale wheels, motor parts, bulkheads, tail plug, skid wheels are all finished and formed ready for assembly. Struts are cut to size and streamlined; elevator and rudder surfaces are formed. 5 pieces of colored tissue, rubber, rubber lubricant, brush, insignia, cement and dope, also 3 plans and separate complete instruction and coloring chart, are furnished to insure a perfect construction job. Price complete— \$2.50

Other Flying Kits with Fully Finished Parts
Goettingen 1.....\$1.50 The Flying Flea.....\$2.00
Fokker D-8.....2.00 Kawasaki.....2.50
Vought Bomber.....\$3.00

"TRU-DETAIL" SOLID SCALE MODELS of the SAMOA and CHINA CLIPPERS

Wing Span 15 1/4"
Length 10 5/8"



\$1.50

Postpaid

Over 50 parts—Finished: 4 3-Blade Propellers, 4 Turned Cowlings and formed Motor Nozzles, partly finished Hull, Wing, Tail Surfaces and Spoilers; also Nails, Wire, Sandpaper, Colors, Insignias, Celluloid, Cement and Blue Print. These are not Balsa wood kits, but are made of a fine strong wood that will make a lasting model that will not splinter or crack.

Other Solid Scale Partly Finished Kits
Boeing P 26 A.....75c French Braquet Night
Winne Mae.....75c Bomber.....75c
Fairly Hendon Bomber.....75c

SPECIAL—Five piece Wood-Carving Set designed especially for those who carve solid scale model airplanes. Postpaid \$6c
Send \$1.00 for our complete catalogue with propeller, motor efficiency chart and guide.

International Models Company
251 West 55th Street New York, N. Y.
Distributors in all Foreign Countries

Designed primarily as a supply transport, the ship is convertible into either a hospital plane or an eleven passenger transport.

During 1937 the Lockheed Company built 85 airplanes which consisted of 46 Electras, 34 Model "12s" and 5 Model "14s."

Harry Crosby is said to be considering developing a small fighter from his all-metal racer for export and may also launch into the production of a small low-powered sportplane.

Bids on new military aircraft will be opened on the following dates: Two-engined, light, personnel transport—Feb. 8, 1938; observation—September 26, 1938; single-engine, single-place pursuit—Sept. 27, 1938; two-engined bomber—February 2, 1939.

Vance Breese's new ship that was built by the Bennett Aircraft Company met some bad luck when it had to land on its belly during a test hop. The damage is repairable fortunately.

Bellanca has also tested their new 3-place, low-wing, full cantilever monoplane. Models, both deluxe and standard, will be offered with 90 and 70 hp. radial engines. 72 lbs. of baggage will be carried with a cruising range of 500 miles.

The White Aircraft Company of Buffalo is developing a plane powered

with a 160 hp. Menasco engine with a gross weight of 2,500 lb. It will be a three-place amphibian.

Larry Brown is once more actively engaged in building an airplane. His first product will be a small sportplane powered by a 90 hp. Menasco, with high speed and the full system of Handley Page slots and flaps its main features.

The National Aircraft Company of which W. Curtiss Rockefeller is chief engineer has been organized to build military training planes in Long Beach, California. The Bureau of Air Commerce now has on order a flying wing airplane with nose wheel and powered by a 125 hp. engine. It is being built in New Philadelphia, Ohio.

Specifications of the new Abrams Photographic Strata-plane as it is called are as follows:

Wing area—191 sq. ft.
Gross weight—3,200 lbs.
Weight empty—1790 lbs.
Top speed, sea level—185 m.p.h.
Top speed, 10,000 ft.—200 m.p.h.
Landing speed—66 m.p.h.
Rate of climb—1,800 ft./min.
Service ceiling—21,000 ft.
Cruising range—1,400 miles.
Power plant—Wright R975-E 330 hp. @ 2100 r.p.m.

This new Abrams product is one of the first airplanes ever built expressly for photographic work. The design of such a plane is not a simple procedure, as the following features must be incorporated, such as perfect forward and downward visibility for the pilot, ability to ascend rapidly to high altitudes, high cruising speed, stability, at least an eight hour fuel supply, super-charged motors and arrangements for supplying oxygen to the photographic crew. Though the present airplane has only 330 hp., future models are being considered that will carry as much as 1,000 or more horsepower to get the ultimate in high altitudes and performance.

In England a small, compact twin-engined six-place airplane made its first test hop recently. It was built by the manufacturers of the famous Percival Mew Gull racers. Construction is all-wood and the low-wing airplane is very speedy in appearance. Two Gipsy Six in-line engines power the plane.

Another new English creation is the Fairey Sea-Fox reconnaissance seaplane which fulfills a mission for the English Navy as our SOC-Is do for our own Navy. It is a biplane of rather clean design though typically English with a Napier Rapier up forward and twin floats underneath.

The following list of French airplanes have recently been put through their maiden tests:

LeO-45 bomber with two Hispano-Suiza 1,100 hp. engines.

The latest Amiot 370 racing plane. Air-Couzinet 10.

Bloch 300 "Pacifique" powered by three Gnome-Rhone K-14 engines with top speed of 210 m.p.h.

Bloch 131 No. 2 high speed bomber with two Gnome-Rhone engines.

Morane-Saulnier M.S. 430 two-seater pursuit trainer.

Morane Saulnier M.S. 405 No. 1 pursuit.

Farman 2200 trans-Atlantic airplane powered by four Hispano-Suiza 690 hp. engines.

Lignel 20 low-powered racing plane for Coup Deutsch Race. Powered by Renault 220 hp. engine.

Amiot 150-Be explorer and bomber seaplane with two Gnome-Rhone 740 hp. engines.

Breguet 462 Vultur bomber with two Gnome-Rhone 950 hp. engines.

As we go to press the Curtiss Company has just been the recipient of another large order from the Navy for a fleet of scout bombers.

How to Build a Scale Model of the Latest Consolidated Navy Flying-boat, the XPB2Y-1

In so many words Major Fleet, president of Consolidated, said that the next big flying dreadnaught built by his company will make its most recent four-engined airplane look small. However, such a plane cannot be built over night and steps must be taken to gradually work up to the larger aircraft. The XPB2Y-1 could be called one of those steps and is certainly a great advancement in patrol bomber development. The bomber is powered by four 1,050 hp. Pratt & Whitney twin-row Wasps and has a cruising range of 5,000 miles. Access may be made to the engines through passageways in the wing while the plane is in flight.

Make the entire model of balsa wood which may be purchased from any supply company advertised in this magazine. Also purchase a tube of model cement and small cans of red, white, blue, yellow and black dope.

Now when you begin the construction start with the idea that it is going to be a masterpiece and take your time. Always be sure the grain of the wood is running lengthwise. If you prefer to make your model smaller or larger than the accompanying plans, take the plans to your printer and have them photostated to your desired size at very little cost. Then you will have full-sized plans to work with.

Make the hull first. Draw the outline of the side view on stock and cut to shape with a jig-saw. Go over the top and bot-

THE THUNDER BIRD



By the Designers of such outstanding models as the original Bullpup, Chieftain, Starlet, Bay Ridge like and others.

Kit contains, besides all necessary wood, etc., finished maple prop (state size), cut out ribs, shaped trailing edge, 1/2 pt. each of cement and dope, plus two 1/2 pts. of colored dope, streamlined pneumatic wheels. Largest single sheet gas model plan, showing upright, inverted and radial motor mount. Timing switch detail, etc.

Complete at \$5.95 P.P.

Minus wheels and colored dope \$3.95 P.P.

Ready-to-run Mighty Midget motor with De Luxe Model \$15.45 P.P.

Maple props for any motor.....75c P.P.

Write for combination offer with any motor.

NEW CYCLONE AIRCRAFT CO.

397-11th St., Brooklyn, N. Y.

BUY YOUR BROWN Jr. MOTOR FROM M & M

WE ARE NORTHWEST DISTRIBUTORS

Type "C" \$17.00 POSTPAID

Type "B" \$21.50 POSTPAID

Send To Us For Immediate Delivery

Champion
New Plugs
Only 65c Prepaid

Hurleman
Come Apart Plugs
Now Only 75c Prepaid

Gas Wheels

Rubber Powered Wheels

When Thinking of Model Protection

Think of M & M Super Wheels

3 1/2" & 4 1/2" Gas wheels—weight 2 1/2 and 5 oz. per pair.

Now only \$2.75 per pair, postpaid

All M & M Wheels Paid and Post. Pend.

M & M's FOR LARGER GAS MODELS

Size 6" x 1 1/2". Price \$4.50 per pair P.P.

M & M 3 1/4" GAS WHEELS

with improved M & M axle housing \$1.50

for 9/64th or No. 28 drill rod axle

Designed for Light Weight Gas Models.

Weight approximately 1 1/2 oz. per pair.

M & M WHEELS

From your Dealer or

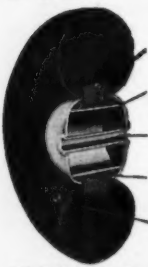
send to us.

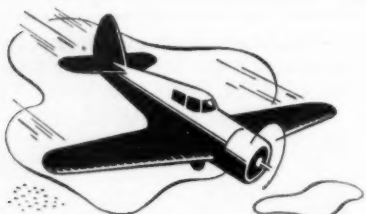
Per Pair Post Paid

For Air Mail Add 25c

M & M MODEL WHEEL CO.

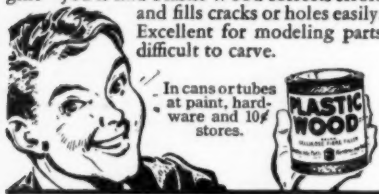
325 North 79th Street Dept. M4, Seattle, Wash.





It's Lots of Fun building model airplanes with PLASTIC WOOD

It's the ideal modeling medium! Handles like putty, and hardens into real wood that can be carved, sanded, lacquered, painted or varnished. If you're working on propellers, fuselage, engine—you'll find Plastic Wood corrects errors and fills cracks or holes easily. Excellent for modeling parts difficult to carve.



tom with coarse sandpaper and then draw on the top view, in corresponding position to side view. Shave down the sides with a small flat chisel, always pushing it with the grain. Then with your chisel and a sharp razor blade, round off the corners as shown by cross-sections on plans. Sandpaper thoroughly with first coarse and then fine sandpaper.

Make the wing in the same manner, first drawing on top view and cutting, then tapering it down as shown in front view of model, and then forming airfoil section. Cut grooves in leading edge of wing to hold engine nacelles. The wing tip floats may be made stationary or retractable as you wish.

The tail units are very easily made from sheet balsa with your razor blade. Make them with care however and see that their surfaces are very smooth as the slightest groove may show up when the paint job is applied.

The engine cowl and nacelle may be made as one piece. Do not spend too much time shaping out the nacelle as that can better be done after it is attached to the wing.

In making a propeller make the three blades separately and cement them to a central hub.

After all parts are made, begin the assembly. Place the hull in flying position on a flat surface and cement the wing to the top with plenty of care. After connection has dried, filleting between wing and hull may be done with putty where necessary. Join the horizontal tail in place and then the vertical tail.

Put the nacelles in the wing with plenty of cement and finish them up. Join the propellers in front. Small machine-guns may be shaped out and mounted as shown. Go over the entire model with fine sand-

paper, brush off all dust and then begin the paint job.

Apply good thick coats at first to let the paint soak in. Many coats will have to be applied before a smooth finish is obtained, but wait for the first coat to dry before applying a second. The insignia on the wing should have a white star with blue background and a red circle in the middle. The wing should be yellow and propellers white. Paint the hull white with black bottom. All trimmings should be black and all windows white.

When you complete your model send us a good picture of it and we will publish it.

N.A.A. News

(Continued from page 21)

ers. While the members of the first T.A.M.B.E. devoted most of their attention to building rubber-powered craft, the second club took up the building of gas driven models with all the ardour of pioneers.

The following incident exemplifies the profound interest T.A.M.B.E. boys take in flying airplanes in competition. Last Spring a group of members piled their ships and themselves in a very old, borrowed car, the best transportation that they could get, and started off from Brooklyn to attend a Meet at Hadley Field, New Jersey, which is a distance of approximately 44 miles. They left at 8 o'clock in the morning, happy and gay. By the time they got to the Manhattan Bridge they realized that their eight-cylinder car was running on only four cylinders. When they finally got to the Holland Tunnel they had to argue with the policeman there to permit them to go through. He suggested that they would make better time by using the ferry. Finally after three hours of uncertain riding, they arrived at the field, a trip which ordinarily takes one hour and twenty minutes.

After the contest, the boys decided to start home. At about a mile and one-half from the field the car broke down. Thereupon, the boys got out and pushed that car for a mile and one-half to the nearest repair shop. There they found that their total cash was exactly fifty cents, due to the fact that the car used about ten times more gas and oil than it should have. As for the car, it was beyond repair. The mechanic took one look at it and offered them twenty-five cents for it as junk. One of the boys called his father long distance collect, and he arrived some later in his own car. They arrived home at 4 a.m.

T.A.M.B.E. holds an annual model airplane meet in New York City which draws well over 200 contestants. The 1937 meet was held in conjunction with the Police Department of the City of New York through their Police Athletic League at Marine Park in Brooklyn. More than 42 prizes were donated by civic leaders and supply dealers.

At regular weekly meetings we have general discussions on all phases of model aerodynamics and construction of model planes. All the members are encouraged to create and experiment with new ideas

in model engineering. New methods of construction are in evidence at every weekly meeting.

Looking toward the future, Mr. David Lynn asserts that what the model building hobby in New York City needs is, first, a park field arranged for the conducting of model airplane meets; and second, the support of the Board of Education through its Bureau of Extension Activities. No suitable area exists in New York City devoted solely to flying model airplanes such as is maintained by the City of Los Angeles. Constructing such a field would be the proper subject for a joint project by the Department of Parks and the WPA. Also important is the organization of clubs in the Evening Recreation Centers throughout the city under the tutelage of competent instructors for boys and girls in the art and craft of building beautiful and efficient model airplanes.

Youth Education Program Adopted at N.A.A. Convention

The First National Planning Conference, held in Cleveland January ninth through the twelfth, was a scene for much action.

During the four-day program, many matters were discussed and much accomplished. The following five items were adopted by the Conference as most important and most likely to further youth aviation education.

1. There should be an integrated program for youth aviation education and for step-by-step training (model building, gliding, light-plane flying, soaring) carried out on a nation-wide scale under the direction of the N.A.A. This program should have the active support of the aviation industry and the government.
2. Gas model building should be encouraged and the N.A.A. program for supervision of this activity supported by state and federal officials.
3. Additional appropriations should be made available to the Federal Office of Education to the end that more extended service may be furnished

THE "BAT" MOTOR



The "Mystery" Airplane Motor now in production and shipments made immediately. Weighing only 4 1/2 ounces (2 1/2" diameter)—the power developed is marvellous. Runs upright or inverted. Files models 3 lbs.; 6 foot span.

The "BAT" never loses compression, so is easy to start.

One of the secrets of the "Mystery" is the expensive but genuine "Vanassil" piston and rings. They never wear out and the longer you run a "BAT" the better it gets. "Vanassil" is lighter than aluminum. Price \$15.00 U.S.A. postpaid, mounted on wood skids Complete (except propeller), Skeleton aluminum bracket mountings, S.O.C. extra.

RAY DAY PISTONS, INC.
27th Ave. West & Commodore Way,
Seattle, Wash.

BERKELEY DESIGNED...

MEANS SUPERIORITY

standard of comparison.

Whenever model builders get together, Berkeley designed models are always the In a class by themselves, no one has succeeded in equaling their performance and value.



New Catalog—Every model builder who wants the best must have our catalog listing "Berkeley Approved" model supplies. Please include 10c to cover handling charges and postage.

The "BUCCANEER—STANDARD" Limited Engine Run Champion

5½-ft. wingspan—for ¼ to 1.5 h.p. motors. Three times winner in the three biggest eastern contests of the year. Each time first against a field of 475 other models. Average duration on a 40-second motor run was over six minutes! Everything you desire in a small, high-powered gas model. Beautiful lines, easy construction, snappy performance, and, best of all, a custom gas model priced with the lowest mass production kits. It has no competition for limited engine run contest flying. No kit at even several dollars more can compare with it for completeness. Full size plans. Hardware and ignition equipment. All wooden parts printed out. Large can of cement. Three colors of dope. Complete kit less wheels and power plant \$5.00 P.P. in U.S.A.

\$5.00
P.P. in U.S.A.

The "Super-Buccaneer" RECORD BREAKER 7 1/2 ft. Wingspan

During the Fall contest season the "Super-Buccaneer" won six "Firsts," six "Seconds," and four "Thirds" places in major model contests throughout the country. It can do the same for you this Spring! Kit includes: Full size plans; Wooden parts printed out. Hardware and ignition equipment. Full cans of cement and colored dope. Everything to complete the model as pictured except wheels and power plant.

\$8.50
P.P. in U.S.A.



The New
"CUSTOM-CAVALIER"
9 ft. Wingspan



Simplified MONOCOQUE CONSTRUCTION for ½ to ½ h.p.

When you own a "Custom-Cavalier" you are "tops" among model builders. Kit is complete even to silk for covering and "pearlene" dope. Everything to build the model as pictured except wheels and power plant.

\$15.00 P.P. in U.S.A.

"The Aristocrat of Model Airplanes"

BERKELEY MODEL SUPPLIES

"FIRST IN GAS MODELS"

Dept. U-34,

BROOKLYN, N. Y.

BERKELEY APPROVED... MOTORS AND ACCESSORIES

New 1938 Ohlsson Gold Seal Motor



Berkeley is proud to announce the Eastern Distributorship for this amazing new engine. Immediate delivery from stock.
\$18.50 P.P.

BROWN MOTOR

IN TWO MODELS

MODEL B

With ground and fitted steel piston.

\$21.50
P.P.

MODEL C

With Aluminum alloy piston and rings.

\$17.00
P.P.

FREE PROPELLER WITH EVERY NEW MOTOR

OHLSOHN STREAMLINED WHEELS

2½" dia. \$1.25 pr. P.P.
3½" dia. 1.90 pr. P.P.
4½" dia. 1.75 pr. P.P.

HURLEMAN IGNITION COIL

With mounting brackets. Gives hottest spark of any model coil. \$2.50 P.P.

SPARK PLUGS

Champion 65c ea.
Hurleman 75c ea.
Brown \$1.00 ea.

FLIGHT TIMER

For accurately controlling your flight time from 1 to 60 seconds inclusive. Weight 2½ oz. **\$3.00** P.P.

TRADE IN YOUR OLD MOTOR

Write for the very best allowance on your old motor, regardless of make or condition. State make and model of your old motor when writing.

IN YOUR MAIL BOX

every month for 12 consecutive months—several days before your own newsstand gets copies. Convenient isn't it? Your copy of

MODEL AIRPLANE NEWS

reserved and delivered to you—and at a saving. Why not subscribe now? Send \$1.65 today! You've probably been wanting to build the famous DOUGLAS TRANSPORT for a long time—well, you can start soon for we're giving away complete plans with each yearly subscription.

FREE COMPLETE PLANS to build the popular DOUGLAS TRANSPORT DC-1

½" scale of the famous Transcontinental Transport. Accurately designed and faithfully detailed. Two sheets, (53" x 33" and 43" x 32"), provide full size 3 view drawings with all details and instructions. We have a limited number of these plans, so send your subscription in today to insure getting yours. These plans have been selling for \$1.00.

FILL IN THIS COUPON AND MAIL

MODEL AIRPLANE NEWS, 4
551 Fifth Ave., New York
Enclosed find \$1.65. Send MODEL AIRPLANE NEWS for 1 year. Also send me by return mail complete plans to build the DOUGLAS TRANSPORT.

Name

Address

City State.....

This offer good in the United States and its possessions; also Cuba, Canada, Mexico and Panama. All other countries \$2.50.

the school system in the field of youth education in aviation. Such service should include aid material for the setting up and conduct of suitable courses for secondary schools, vocational schools and colleges and otherwise act to encourage school-time aeronautic education.

4. It should be the policy of the government to impose a minimum of regulation upon the sport of gliding and soaring and to determine that minimum with reference to public safety alone. There should be uniformity in federal, state, and municipal regulation and end traffic control.
5. At least one glider expert should be employed by the Bureau of Air Commerce to supervise all matters pertaining to motorless, heavier-than-air aviation.

Among those who took part in the discussion were: Oliver Parks, Discussion Chairman; Ed Clarke, Director of Junior Aviator; Dr. J. C. Wright, Federal Office of Education; H. M. Jellison, Director of Vocational Education, Akron; Charles H. Grant, MODEL AIRPLANE NEWS; H. L. Card, Taylorville, Illinois; Richard C. du Pont, Soaring Society President; Kenneth Benson, Akron University Cloudhoppers; Casey Jones, Casey Jones School of Aeronautics; Mr. H. G. Martin and Byron A. Armstrong, Delgado Trades School; Kenneth Tibbitts, Taylor Aircraft Company; Bernarr Macfadden; Leslie Hardy, Akron University; Mr. Weston.

It was felt that this was a most representative group and that every possible phase of the items listed above have been considered.

Model Chapter Notes

The Bloomington, Illinois, Chapter, starting with their January twelfth meeting, started a membership and are expecting a large amount of success, according to R. Blakney, Director for the group.

The January twelfth meeting had another bright spot. Pilot Art Carnahan spoke to the club about the Miami Air Races, in which he participated.

The moving pictures of the State Model Meet in Louisiana the first part of September are still in great demand in that state. They made their most recent appearance in New Orleans. Joseph Glorioso with the very able assistance of Dr. S. H. McAfee brought these pictures to the New Orleans audiences, who were most appreciative.

Bill Downey, son of F. X. Downey of model fame, is planning to attend the Scale Model Contest to be held at the International Air Show, which is being held in Chicago, as per recent announcement. While young Bill was finishing plans on the Scale Model Contest, his Dad was bringing to life another Chapter in Kansas. This new one is in Hutchinson. Hutchinson will make the fifth Chapter in the State of Kansas. Bill Harold is President, Wolcut Ely, Vice

FLY-A-WAY GLIDER & CONSTRUCTION SETS

FLYING & SHELF SCALE MODELS

20" Kits Full Size Blue Print

These sets do not contain cement.

DK1 Stinson SR 8C	DK7 Rearwin
DK2 Menescope	DK8 Pussmoth
DK3 Taylor Cub	DK9 Cessna
DK4 SE5A	DK10 Bellanca
DK5 Aerona	DK11 Waco Custom
DK6 Endurance	DK12 Hughes Northrup

2 sets 35c Postpaid, U.S.A.

8" Shelf Model Construction Sets

These sets include cement.

N51 Vought V-143 Fighter	N54 Miles Mohawk
N52 Curtiss YA18 Attack	N55 Curtiss P-36 Pursuit
N53 Waco Custom	N56 Taylor Cub

2 sets 35c Postpaid U.S.A.

16" Flying Model Construction Sets

These sets include cement.

F58 Cessna	F53 Taylor Cub
F51 Bellanca	F54 Menescope 80A
F52 Aerona Low Wing	F55 Endurance

2 sets 35c Postpaid U.S.A.

Also many other 8" shelf, 16", 24" and 29" flying, 4" and 10" boat models and Gliders to choose from. Send 5c for complete catalogue. If your dealer cannot supply you, order direct.

PAUL K. GUILLOW

WAKEFIELD, MASS.

PRESENTING our..



1" Scale HUGHES RACER **25c**
Plus 5c for Postage & Packing.

A new day has dawned on solid model-building! Our all-sheet balsa construction has simplified the assembly of this beautiful little model to a degree where it practically "falls together"! Kit has absolutely everything necessary to build model as pictured, EXCEPT LIQUIDS. Model shown above is built from stock kit, length 9 1/2", 3 1/2" in. Our thoroughly-engineered instruction sheet is much more than the average outline drawing as included with most kits of this type. It is a valuable, "Step-by-Step SUPER-FEATURE" sheet which is really a course in model-building, and actually worth more than the price of the complete kit. All sheet wood is beautifully and accurately printed. We have received many compliments on this superb little kit, one from America's largest model concern! BE SURE TO BUILD ONE! Send well wrapped coins for your kit TODAY!

CLIFFORD SCALE MODELS
Clarks Fork, Idaho

President, and Jack Dunlap, Secretary-Treasurer. H. L. Fenn will act as the sponsor for the newly-formed Chapter. That whole Downey family seem to keep themselves pretty busy all the time.

Another most recent addition to the annals of the Junior N.A.A., is the Birmingham Model Airplane Club, with headquarters at the Tutwiler Hotel, Birmingham, Alabama. The new club will have as its President, Bill De Lorme, its Vice-President will be Bill Shumate and the Secretary-Treasurer, Miss Catherine Phillips. The B.M.A.C. will be sanctioned by the Birmingham Aero Club, radio station WSGN, J. Black & Sons, department store, and Warren Brothers Hardware Company. It would seem that almost the whole city of Birmingham is interested in this group in one way or another. Bill Shumate has written us for the club and reports some mighty fine model work going on down there. Well, Bill, we're glad all you model builders,



12" Shelf Models (New)

These sets include cement
No. 60 China Clipper A4 Sikorsky S42
A2 Douglas Transport DST A5 DeH "Comet"
A3 Martin Bomber A6 Douglas Observation
35c Each Postpaid U.S.A.

K 48—AIRPLANE GLIDER KITE

PRINTED PARTS
48 INCH WING SPREAD. READY TO ASSEMBLE.
TESTED & PROVEN. WILL FLY FOR HOURS. FLY
WITH THREAD, FLY 1000 FEET & HIGHER. A
SENSATION.
70c Postpaid U.S.A.

of a better than the average category, have banded together and are expecting to see our model record lists simply covered with fellows from Alabama.

Before the ink was quite dry on their Charter, the Phoenix, Arizona, Chapter started to lay plans for a state-wide meet to be held the first week end in April. The object of this meet is to prove to everyone that model building is not just a "baby play hobby." Gaylord Webster and Hal Wood will act in an advisory capacity for the group. This new Chapter will be officially known as the "Copperclad Eagles." The club itself has been organized for three and a half years and have had, of course, plenty of experience along this line.

Copperclad Eagles, we are glad to have you all with us.

The South is coming into its own. Atlanta, Georgia, now has its new Chapter, too. J. K. Coppage, N.A.A. Contest Director, is responsible for the new club and will, in the future, act as its official Director. The Atlanta Aero Engineers, as they will be known, number sixteen, 9 gas model members, and 7 regular junior members.

The first N.A.A.-sanctioned contest they plan to hold will be April third, 1938. This meet will be held at Northside Airport, Camp Gordon. It will include rubber events, Class C Stick, Class C Fuselage, Class D Fuselage and 40 second gas jobs.

Another new Chapter was recently formed. Decatur, Illinois, is the favored town. Since their application was made to the N.A.A. on December seventeenth, they are original in selecting their name, Wright Flight Memorial Junior Chapter. If this originality continues, we can expect some great work on the part of Dr. G. E. Folkman and his fellows.

Phil C. Hartman, elected by Kenneth

Stephens, President of the Ludington, Mich., as Chairman of Model Activity, has sent in application for Charter and now the Ludington group is a full-fledged Chapter of the N.A.A. Mr. Hartman will act as Senior Advisor. We're glad to have you with us.

The Hampton Roads Model Association have held elections. The election was held in compliance with N.A.A. regulations. Charles A. Hulcher is the new President and Peter Bergbom, the new Secretary.

The Syracuse Chapter, according to reports from Harry Copeland, the group's official Model Contest Director, is going along smoothly and that Chapter now has a total of 42 active members. All of them are working hard in the eliminations to win trips to the National Meet.

It won't be long now. W. D. Campbell, Secretary of the St. George Flying Club of Bexley, Australia, has written us of the increasing interest on the part of his club in becoming a Chapter of the N.A.A.

Yes, and out in the wide open spaces there are about fifty fellows who are interested in all phases of model building. J. F. Baichtel called a meeting and writes us that all they need is membership application blanks and a Chapter Charter form. Okay, J. F., we sent them, so let's hear from you.

Hangar No. 13

Conrad Hansen, a model builder from way back yonder, has been kind enough to send us a history of the Beloit, Wisconsin, Chapter of the N.A.A. or Hangar No. 13. This history takes in model activities in Southern Wisconsin and Northern Illinois.

Early in 1927 a Model Airplane Club was founded at the Beloit Y.M.C.A. under Mr. A. C. Elley, as advisor. This group dwindled down to a small fistfull of three fellows of which I was one. Later in 1927 an attempt was made to reorganize the model club with mediocre results. This group continued until 1932 with a membership of about 15 model builders. On September 16th, 1932 the Hangar No. 13 Model Airplane Club was organized and a Constitution was drawn up. This club was known as the Hangar No. 13 Model Airplane Club of the Beloit Y.M.C.A. There were 13 members in the club at its formation. Thus we picked the rather odd name.

"Hangar No. 13 continued to grow in membership and model activities. Although I was quite young, 17, I was appointed advisor of the group. It has been the policy of the club to purchase Model supplies in quantities and give material to the club members free of charge outside of their regular dues to the club. This policy has been and will be maintained. It has made the club what it is. At the present time the club handles over \$400.00 worth of material each year not including inventory of supplies on hand and equipment. We possess a High Speed Planer Saw for cutting Balsa Plank, etc.

"In June 1935 Hangar No. 13 received

its charter from the N.A.A. as a Junior Chapter. In addition we chartered groups of the Junior Birdmen and the IGM.A. Gas Models are our specialty and are not condemned. During November, 1936, the club was active in helping organize a Model Club at Rockford, Illinois, then known as the Pla-More Wings Model Airplane Club. This club now at the Boys' Club at Rockford is cooperating 100% with us in Model Activities. Also in April, 1937, a club was formed under our coaching at the Janesville Y.M.C.A. This club now has a membership of over 25. Thus the three cities, Rockford, Janesville, and Beloit were organized."

And that's the story of one group of model builders! With the thought that many of you would be interested in the manner in which this group handles its material and memberships, we are including the yearly Financial Report of Hangar No. 13 for fiscal year from September 16, 1936, to September 16, 1937.

Assets

Cash On Hand.....	\$ 15.89
Dues Taken In.....	140.77
Supplies Sold.....	235.15
Stamp Refund.....	.14
Overdrawn Accounts.....	3.36
Entertainment Fund.....	3.80
Loan Borrowed.....	10.00
Contest Fund.....	15.00
Shipment Charge.....	12.21
N.A.A. Fund	7.50

Total	\$443.82
--------------	-----------------

Liabilities

Maintenance Expense.....	\$ 3.37
Equipment Expense.....	51.82
Special Expense.....	2.45
Supplies Purchased.....	317.02
Shipment Expense.....	19.36
Drawings Purchased.....	2.60
Magazine Expense.....	4.95
Loan Paid.....	10.00
Entertainment Expense.....	4.35
Contest Expense.....	4.95

Total	\$428.37
-------------	----------

Cash On Hand, Sept. 17, 1937.....\$ 15.45

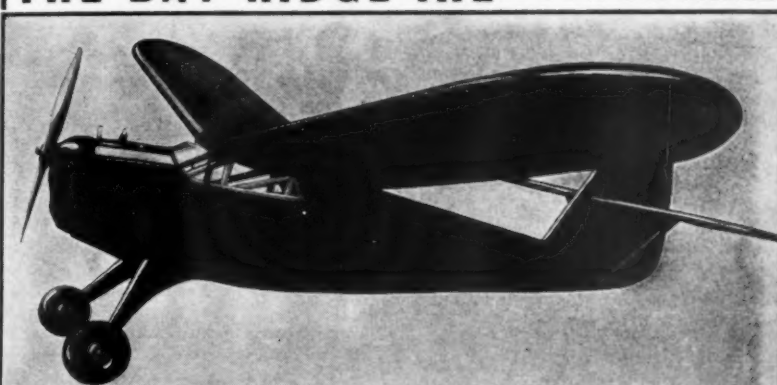
Total	\$443.82
-------	----------

Needed—A Sponsor

There is a model club in St. Joseph, Missouri, who wants to become a Chapter of the N.A.A. but feel that they should have a sponsor. Following is a history of their club and their present activities, as related to us by G. R. Huffman, and N.A.A. Contest Director.

"I organized the club back in 1931. The club hasn't grown in numbers so much as it has in activity. We only have one original member, Lloyd Thompson, now with us. The membership has undergone many changes, hence the lack of growth in numbers. At present the officers are: John W. Bittick, Pres.; Claude Hull, Jr., Vice-Pres.; Francis Brock, Secy.-Treas. and Librarian; Jimmy Mann, assistant Secy. Treas. and G. R. Huffman, Advisor-Instructor and Reporter. We had members participating in the two contests held here last summer. These were held mostly in interest of a commercial nature, but our

THE BAY RIDGE IKE — 6 FT. GAS MODEL



The true actual photo shows you how beautiful the ship looks. It is completely streamlined leaving no parts of the engine exposed. Many new features are found on the plane, such as: needle valve extension, single leg landing gear, raised tail surfaces and inverted engine which also can be mounted upright.

Kit is neatly packed in an attractive box with cut out ribs, shaped propeller, large cans of cement, dope, wire, aluminum sheet, celluloid, screws, nails, balsa wood strips cut to size and many other parts to complete the model.

Complete Kit (except air wheels)....\$3.95 P.P.

Deluxe Kit with air wheels and

colored dope.....6.50 P.P.

Full size plans.....50c P.P.

Special offer. The New Brown Junior engine
(with piston rings) and our deluxe

kit **\$22.50 P.P.**

C. O. D. Orders Filled

Dealers, jobbers write for special discounts.

GAS POWERED SUPPLIES—The Best Obtainable

[illegible]

RUBBER POWERED SUPPLIES—Low In Cost But High In Quality

[illegible]

BAY RIDGE MODEL AIRPLANE & SUPPLY CO.

232-45th Street

Brooklyn, N. Y.

5-in-1 Model Makers Tool

Ideal for the Miniature Maker.
Especially adapted for Balsa Wood.

Rips, Spars, Cuts, Ovals, Squares, Circles, Tracing Railroad Ties, Poles, Cloth; and has many other uses. Adjustable to right or left hand. Time and labor cut in half. Used and approved by leading builders of wood models.

Mailed post paid in U.S.A., Canada, Mexico and South American Countries. **25c.** Foreign, **35c.** Worth many times the price.

Lawren Co., Oakland, Calif.
Bank of Commerce Building, Dept. B



LET PARAGON MAKE
YOUR 3 POINT LANDING!

Use P.M.A.
Quality Supplies!

Rubber Powered Supplies

Balsa Strips

36" Lengths

1/16 x 1/16 .05

1/16 x 3/16 .05

1/16 x 1/2 .05

1/16 x 3/4 .05

1/16 x 1 .05

1/16 x 1 1/4 .05

1/16 x 1 1/2 .05

1/16 x 1 3/4 .05

1/16 x 2 .05

1/16 x 2 1/4 .05

1/16 x 2 1/2 .05

1/16 x 2 3/4 .05

1/16 x 3 .05

1/16 x 3 1/4 .05

1/16 x 3 1/2 .05

1/16 x 3 3/4 .05

1/16 x 4 .05

1/16 x 4 1/4 .05

1/16 x 4 1/2 .05

1/16 x 4 3/4 .05

1/16 x 5 .05

1/16 x 5 1/4 .05

1/16 x 5 1/2 .05

1/16 x 5 3/4 .05

1/16 x 6 .05

1/16 x 6 1/4 .05

1/16 x 6 1/2 .05

1/16 x 6 3/4 .05

1/16 x 7 .05

1/16 x 7 1/4 .05

1/16 x 7 1/2 .05

1/16 x 7 3/4 .05

1/16 x 8 .05

1/16 x 8 1/4 .05

1/16 x 8 1/2 .05

1/16 x 8 3/4 .05

1/16 x 9 .05

1/16 x 9 1/4 .05

1/16 x 9 1/2 .05

1/16 x 9 3/4 .05

1/16 x 10 .05

1/16 x 10 1/4 .05

1/16 x 10 1/2 .05

1/16 x 10 3/4 .05

1/16 x 11 .05

1/16 x 11 1/4 .05

1/16 x 11 1/2 .05

1/16 x 11 3/4 .05

1/16 x 12 .05

1/16 x 12 1/4 .05

1/16 x 12 1/2 .05

1/16 x 12 3/4 .05

1/16 x 13 .05

1/16 x 13 1/4 .05

1/16 x 13 1/2 .05

1/16 x 13 3/4 .05

1/16 x 14 .05

1/16 x 14 1/4 .05

1/16 x 14 1/2 .05

1/16 x 14 3/4 .05

1/16 x 15 .05

1/16 x 15 1/4 .05

1/16 x 15 1/2 .05

1/16 x 15 3/4 .05

1/16 x 16 .05

1/16 x 16 1/4 .05

1/16 x 16 1/2 .05

1/16 x 16 3/4 .05

1/16 x 17 .05

1/16 x 17 1/4 .05

1/16 x 17 1/2 .05

1/16 x 17 3/4 .05

1/16 x 18 .05

1/16 x 18 1/4 .05

1/16 x 18 1/2 .05

1/16 x 18 3/4 .05



Brown Rubber

.045, 18 ft. .05

1/16 Flat, .05

1/8 Flat, .05

1/4 Flat, .05

3/16 Flat, .05

1/2 Flat, .05

5/8 Flat, .05

3/4 Flat, .05

1 Flat, .05

1 1/4 Flat, .05

1 1/2 Flat, .05

1 3/4 Flat, .05

2 Flat, .05

2 1/4 Flat, .05

2 1/2 Flat, .05

2 3/4 Flat, .05

3 Flat, .05

3 1/4 Flat, .05

3 1/2 Flat, .05

3 3/4 Flat, .05

4 Flat, .05

4 1/4 Flat, .05

4 1/2 Flat, .05

4 3/4 Flat, .05

5 Flat, .05

5 1/4 Flat, .05

5 1/2 Flat, .05

5 3/4 Flat, .05

6 Flat, .05

6 1/4 Flat, .05

6 1/2 Flat, .05

6 3/4 Flat, .05

7 Flat, .05

7 1/4 Flat, .05

7 1/2 Flat, .05

7 3/4 Flat, .05

8 Flat, .05

8 1/4 Flat, .05

8 1/2 Flat, .05

8 3/4 Flat, .05

9 Flat, .05

9 1/4 Flat, .05

9 1/2 Flat, .05

9 3/4 Flat, .05

10 Flat, .05

10 1/4 Flat, .05

10 1/2 Flat, .05

10 3/4 Flat, .05

11 Flat, .05

11 1/4 Flat, .05

11 1/2 Flat, .05

11 3/4 Flat, .05

12 Flat, .05

12 1/4 Flat, .05

12 1/2 Flat, .05

12 3/4 Flat, .05

13 Flat, .05

13 1/4 Flat, .05

13 1/2 Flat, .05

13 3/4 Flat, .05

14 Flat, .05

14 1/4 Flat, .05

14 1/2 Flat, .05

14 3/4 Flat, .05

15 Flat, .05

15 1/4 Flat, .05

15 1/2 Flat, .05

15 3/4 Flat, .05

16 Flat, .05

16 1/4 Flat, .05

16 1/2 Flat, .05

16 3/4 Flat, .05

17 Flat, .05

17 1/4 Flat, .05

17 1/2 Flat, .05

17 3/4 Flat, .05

18 Flat, .05

18 1/4 Flat, .05

18 1/2 Flat, .05

18 3/4 Flat, .05

19 Flat, .05

19 1/4 Flat, .05

19 1/2 Flat, .05

19 3/4 Flat, .05

20 Flat, .05

20 1/4 Flat, .05

20 1/2 Flat, .05

20 3/4 Flat, .05

21 Flat, .05

21 1/4 Flat, .05

21 1/2 Flat, .05

21 3/4 Flat, .05

22 Flat, .05

22 1/4 Flat, .05

22 1/2 Flat, .05

22 3/4 Flat, .05

23 Flat, .05

23 1/4 Flat, .05

23 1/2 Flat, .05

23 3/4 Flat, .05

24 Flat, .05

24 1/4 Flat, .05

24 1/2 Flat, .05

24 3/4 Flat, .05

25 Flat, .05

25 1/4 Flat, .05

25 1/2 Flat, .05

25 3/4 Flat, .05

26 Flat, .05

26 1/4 Flat, .05

26 1/2 Flat, .05

26 3/4 Flat, .05

27 Flat, .05

27 1/4 Flat, .05

27 1/2 Flat, .05

27 3/4 Flat, .05

28 Flat, .05

28 1/4 Flat, .05

28 1/2 Flat, .05

28 3/4 Flat, .05

29 Flat, .05

29 1/4 Flat, .05

29 1/2 Flat, .05

29 3/4 Flat, .05

30 Flat, .05

30 1/4 Flat, .05

30 1/2 Flat, .05

30 3/4 Flat, .05

31 Flat, .05

31 1/4 Flat, .05

31 1/2 Flat, .05

31 3/4 Flat, .05

32 Flat, .05

32 1/4 Flat, .05

32 1/2 Flat, .05

32 3/4 Flat, .05

33 Flat, .05

33 1/4 Flat, .05

33 1/2 Flat, .05

33 3/4 Flat, .05

34 Flat, .05

34 1/4 Flat, .05

34 1/2 Flat, .05

34 3/4 Flat, .05

35 Flat, .05

35 1/4 Flat, .05

35 1/2 Flat, .05

35 3/4 Flat, .05

36 Flat, .05

36 1/4 Flat, .05

36 1/2 Flat, .05

36 3/4 Flat, .05

37 Flat, .05

37 1/4 Flat, .05

37 1/2 Flat, .05

37 3/4 Flat, .05

38 Flat, .05

38 1/4 Flat, .05

38 1/2 Flat, .05

38 3/4 Flat, .05

39 Flat, .05

39 1/4 Flat, .05

39 1/2 Flat, .05

39 3/4 Flat, .05

40 Flat, .05

40 1/4 Flat, .05

40 1/2 Flat, .05

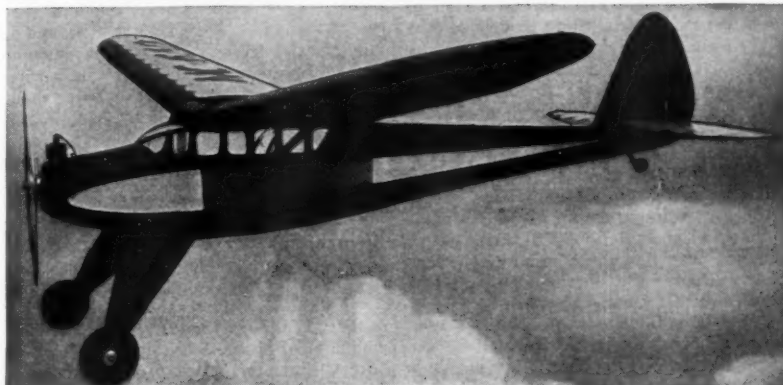
40 3/4 Flat, .05

41 Flat, .05

41 1/4 Flat, .05

41 1/2 Flat, .05

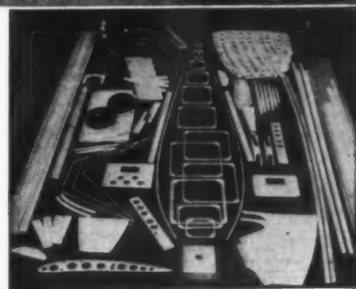
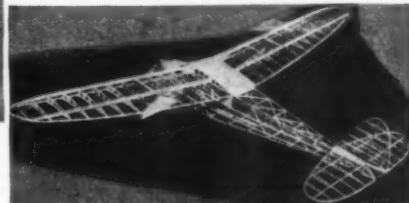
A DELUXE PREFABRICATED GAS MODEL



THE ORIOLE TAPERED WING MONOPLANE, with its increase in size is proportionately lighter and more rugged, with a greater factor of lift and inherent stability, making it ideal for radio control.

Drawings complete with full detail views and dimensions. Members of kit are marked corresponding to numbered parts in drawings with complete instructions.

Specifications { Wt. 8 lbs. 2 oz.
Wingspan 10 feet.
Length overall 75 inches.
Power—Any 1/3 H.P. Motor.



1st—Prefabricated To Simplify Construction. All parts cut, bored, shaped, routed and sanded with fuselage stations built up, eliminating many costly mistakes and disappointments, also making building interesting (without being tedious) thus insuring accuracy, good results and excellent performance.

2nd—Material. Selected bass, ash and aircraft sitka spruce (balsa used only for faring). Special fine, light and strong plywood. ★ Music Wire. ★ Cast aluminum silicon alloy tail wheel fork. ★ Duralumin for fittings. ★ Covering a strong, light fabric which dopes well, giving a smooth durable finish. ★ M & M 4 1/2" Air wheels. ★ Seven yards fabric. ★ One gallon dope designed to give best results. ★ One quart cement.

3rd—Design. Rugged, light aerodynamically efficient, plus good appearance and easy maintenance. Access to motor, coil and condenser without removing cowls. ★ Wing-panels and tail surfaces quickly demountable.

DeLuxe Kit complete, less motor.....\$29.50

Dry Kit, less wheels, dope and cement.....\$22.75

See Your Dealer: If he cannot supply you, order direct from us enclosing Dealer's name and address.

AVION MODEL AIRCRAFT AND SUPPLY CO.

P. O. BOX 906

WOONSOCKET, R. I.

for entry in the contest. Mr. Caldwell also says:

"We flew the last heats of the Angus and Cootie and Anthony Hordern Trophy's last week, which resulted in a straight win in the Angus and Cootie for I. Frost of Goulburn, and in the Anthony Hordern Contest a final will be flown between E. E. Luke of Sydney, and P. Terry of Mayfield, on the 26th of December.

"Since the amalgamation of the two main bodies here in Australia the members have come closer together and arrangements are under way to have an inter-city contest between Sydney and Newcastle. As this means that members will have to travel 100 miles to the flying field, it shows enthusiasm for the game is on the upward trend.

"The club now has an official photographer who will attend all meetings, so in the future I will be able to keep you well supplied with pictures of our activities. If these pictures are not suitable for reproduction please let me know so that I can send different ones in the future."

Brazil

Picture No. 8 shows an amazing and picturesque scene. In it you see a sea-plane gas model which was built by Otto Dunhofer of Rua Anita Garibaldi 23, Capacabana, Rio de Janeiro, Brazil. The plane is resting upon the lagoon, Lagoa Rodrigo de Freitas. The peak which appears in the background is called Corco Varda, on the top of which is an immense statue of Christ. The plane is a twin

float monoplane with monocoque fuselage and tapered wings. The wings taper both in chord and thickness. The plane is of all-balsa construction, except the motor mounts which are made of maple. The motor is completely enclosed and the hood may be detached for inspection. There is even a spinner on the propeller. The floats are of monocoque construction also, and are divided into twelve watertight compartments. They are supported by two full cantilever streamlined struts. The bottom of the floats are "V" shaped and have one step 1/4" high. The wing span of the ship is eighty-six inches. The plane is powered with a Brown Junior engine. Mr. Dunhofer says he and his brother believe this to be one of the first gas models in Brazil, if not in South America. He does not state, however, whether or not its flights were successful. We will wait with interest to hear this.

Italy

We do not hear much about Italian aviation, so the news which Enrico Barzetti sends us holds much interest. He has written a few words as follows:

Flying Models in Italy

"I know the methods of building of the American and German model builders; now I wish to inform the readers of MODEL AIRPLANE NEWS about the Italian method.

"First I will say that whilst the Americans build scale models, the Italians never do build reproductions of original large airplanes, because an airplane and a

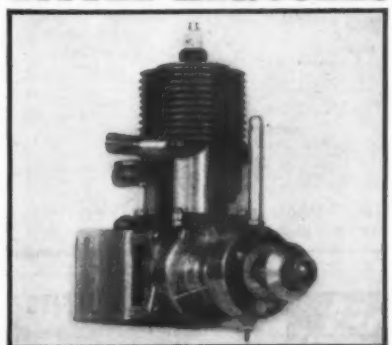


INKOGRAPH Pencil Pointed Fountain Pen

Point perfect for any style of writing. Excellent for carbon, ruling, and rapid work. 14K Solid Gold Point. Fully guaranteed. Only \$1.00 postage paid.

SEVAN CO., Dept. 4M, 7 E. 42 St., New York City

LITTLE HERCULES



AMERICA'S FINEST MODEL MOTOR

There is no single important advancement that LITTLE HERCULES does not have,—always first in design,—and first in performance too.

Piston Rings, Ball Bearings, Lightweight Alloy Piston, etc., all have been introduced by LITTLE HERCULES. Its ignition system and spark coil is 30% more efficient, needing no boosters. You can buy a cheaper motor, but you cannot buy a more reliable, more powerful one.

For planes from 6 to 12 Foot wingspan, it will power your present plane to perfection, while it has sufficient reserve power for that radio job you have in mind. The 1938 Model at \$17.75 has a new radial, unbreakable mounting.

Quality and satisfaction are our selling points.

Enclose stamp for literature.

FORSTER BROTHERS

319 Lake Street,

Maywood, Illinois

DEALERS! CLUBS! AMAZING OFFER

FREE
WITH EVERY
ORDER

One Dozen (Assorted)
15" FLYING KITS
Valued at \$1.20

ABSOLUTELY FREE
WITH EVERY ORDER

Highest Quality at Lowest
Wholesale Prices

BALSA WOOD	BAMBOO	BROWN RUBBER
For 30" lengths, double cost of 18" size.	1/16 sq. x 12".....19	1/32 sq.25
18" Strips	1/16 x 1/4 x 15".....06	1/16 sq.35
1/16 sq.08	Gross05	1/16 sq.48
200 for.....20	1/16 Diam.15	1/16 sq.50
1/16 x 1/4.....27	3/32 Diam.18	3/16 Flat.....60
200 for.....25	1/8 Diam.20	1/16 sq.30
3/32 sq.25	50 ft.18	1/16 sq.35
1/8 sq.30	30 SKEWELS	1/16 sq.40
200 for.....30	1/16 x 12".....18	1/16 sq.45
1/8 x 1/4.....35	1/16 x 10".....18	1/16 sq.50
200 for.....35	1/8 x 18".....23	1/16 sq.55
3/16 sq.40	3/16 x 36".....35	1/16 sq.60
200 for.....40	1 Doz.....35	1/16 sq.65
1/4 sq.45	BALSA DRIED	1/16 sq.70
40 for.....50	PROPS.	1/16 sq.75
1/4 sq. 8 for.....25	5" Doz.....30	1/16 sq.80
18 Sheets	6" Doz.....35	1/16 sq.85
1/8 x 2.....14	7" Doz.....40	1/16 sq.90
20 for.....15	8" Doz.....45	1/16 sq.95
1/32 x 2.....15	9" Doz.....50	1/16 sq.1.00
20 for.....16	10" Doz.....55	1/16 sq.1.05
1/32 x 3.....30	12" Doz.....60	1/16 sq.1.10
20 for.....30	WOOD MAN-	1/16 sq.1.15
1/16 x 2.....38	CARDS STAND	1/16 sq.1.20
20 for.....38	AND PROPS.	1/16 sq.1.25
3/32 x 2.....41	5" Doz.....20	1/16 sq.1.30
20 for.....41	6" Doz.....25	1/16 sq.1.35
3/32 x 3.....42	7" Doz.....30	1/16 sq.1.40
20 for.....42	8" Doz.....35	1/16 sq.1.45
1/8 x 2.....43	9" Doz.....40	1/16 sq.1.50
20 for.....43	10" Doz.....45	1/16 sq.1.55
1/8 x 3.....46	BALSA OR	1/16 sq.1.60
20 for.....46	HARDWOOD	1/16 sq.1.65
1/4 x 2.....46	WHEELS	1/16 sq.1.70
20 for.....46	1 1/2" Doz.....09	1/16 sq.1.75
1/4 x 3.....48	2" Doz.....11	1/16 sq.1.80
20 for.....48	1 1/2" Doz.....14	1/16 sq.1.85
1/2 x 2.....54	2" Doz.....16	1/16 sq.1.90
20 for.....54	1 1/2" Doz.....19	1/16 sq.1.95
1/2 x 3.....75	2" Doz.....21	1/16 sq.2.00
20 for.....75	1 1/2" Doz.....24	1/16 sq.2.05
18" Planks	2" Doz.....26	1/16 sq.2.10
1 x 1 1/2 each.....05	1 1/2" Doz.....29	1/16 sq.2.15
1 x 2 each.....08	2" Doz.....31	1/16 sq.2.20
1 x 3 each.....10	1 1/2" Doz.....34	1/16 sq.2.25
1 x 4 each.....13	2" Doz.....37	1/16 sq.2.30
1 x 5 each.....16	1 1/2" Doz.....40	1/16 sq.2.35
1 x 6 each.....19	2" Doz.....43	1/16 sq.2.40
1 x 7 each.....22	1 1/2" Doz.....46	1/16 sq.2.45
1 x 8 each.....25	2" Doz.....49	1/16 sq.2.50
1 x 9 each.....28	1 1/2" Doz.....52	1/16 sq.2.55
1 x 10 each.....31	2" Doz.....55	1/16 sq.2.60
1 x 11 each.....34	1 1/2" Doz.....58	1/16 sq.2.65
1 x 12 each.....37	2" Doz.....61	1/16 sq.2.70
1 x 13 each.....40	1 1/2" Doz.....64	1/16 sq.2.75
1 x 14 each.....43	2" Doz.....67	1/16 sq.2.80
1 x 15 each.....46	1 1/2" Doz.....70	1/16 sq.2.85
1 x 16 each.....49	2" Doz.....73	1/16 sq.2.90
1 x 17 each.....52	1 1/2" Doz.....76	1/16 sq.2.95
1 x 18 each.....55	2" Doz.....79	1/16 sq.3.00
1 x 19 each.....58	1 1/2" Doz.....82	1/16 sq.3.05
1 x 20 each.....61	2" Doz.....85	1/16 sq.3.10
1 x 21 each.....64	1 1/2" Doz.....88	1/16 sq.3.15
1 x 22 each.....67	2" Doz.....91	1/16 sq.3.20
1 x 23 each.....70	1 1/2" Doz.....94	1/16 sq.3.25
1 x 24 each.....73	2" Doz.....97	1/16 sq.3.30
1 x 25 each.....76	1 1/2" Doz.....1.00	1/16 sq.3.35
1 x 26 each.....79	2" Doz.....1.03	1/16 sq.3.40
1 x 27 each.....82	1 1/2" Doz.....1.06	1/16 sq.3.45
1 x 28 each.....85	2" Doz.....1.09	1/16 sq.3.50
1 x 29 each.....88	1 1/2" Doz.....1.12	1/16 sq.3.55
1 x 30 each.....91	2" Doz.....1.15	1/16 sq.3.60
1 x 31 each.....94	1 1/2" Doz.....1.18	1/16 sq.3.65
1 x 32 each.....97	2" Doz.....1.21	1/16 sq.3.70
1 x 33 each.....1.00	1 1/2" Doz.....1.24	1/16 sq.3.75
1 x 34 each.....1.03	2" Doz.....1.27	1/16 sq.3.80
1 x 35 each.....1.06	1 1/2" Doz.....1.30	1/16 sq.3.85
1 x 36 each.....1.09	2" Doz.....1.33	1/16 sq.3.90
1 x 37 each.....1.12	1 1/2" Doz.....1.36	1/16 sq.3.95
1 x 38 each.....1.15	2" Doz.....1.39	1/16 sq.4.00
1 x 39 each.....1.18	1 1/2" Doz.....1.42	1/16 sq.4.05
1 x 40 each.....1.21	2" Doz.....1.45	1/16 sq.4.10
1 x 41 each.....1.24	1 1/2" Doz.....1.48	1/16 sq.4.15
1 x 42 each.....1.27	2" Doz.....1.51	1/16 sq.4.20
1 x 43 each.....1.30	1 1/2" Doz.....1.54	1/16 sq.4.25
1 x 44 each.....1.33	2" Doz.....1.57	1/16 sq.4.30
1 x 45 each.....1.36	1 1/2" Doz.....1.60	1/16 sq.4.35
1 x 46 each.....1.39	2" Doz.....1.63	1/16 sq.4.40
1 x 47 each.....1.42	1 1/2" Doz.....1.66	1/16 sq.4.45
1 x 48 each.....1.45	2" Doz.....1.69	1/16 sq.4.50
1 x 49 each.....1.48	1 1/2" Doz.....1.72	1/16 sq.4.55
1 x 50 each.....1.51	2" Doz.....1.75	1/16 sq.4.60
1 x 51 each.....1.54	1 1/2" Doz.....1.78	1/16 sq.4.65
1 x 52 each.....1.57	2" Doz.....1.81	1/16 sq.4.70
1 x 53 each.....1.60	1 1/2" Doz.....1.84	1/16 sq.4.75
1 x 54 each.....1.63	2" Doz.....1.87	1/16 sq.4.80
1 x 55 each.....1.66	1 1/2" Doz.....1.90	1/16 sq.4.85
1 x 56 each.....1.69	2" Doz.....1.93	1/16 sq.4.90
1 x 57 each.....1.72	1 1/2" Doz.....1.96	1/16 sq.4.95
1 x 58 each.....1.75	2" Doz.....1.99	1/16 sq.5.00
1 x 59 each.....1.78	1 1/2" Doz.....2.02	1/16 sq.5.05
1 x 60 each.....1.81	2" Doz.....2.05	1/16 sq.5.10
1 x 61 each.....1.84	1 1/2" Doz.....2.08	1/16 sq.5.15
1 x 62 each.....1.87	2" Doz.....2.11	1/16 sq.5.20
1 x 63 each.....1.90	1 1/2" Doz.....2.14	1/16 sq.5.25
1 x 64 each.....1.93	2" Doz.....2.17	1/16 sq.5.30
1 x 65 each.....1.96	1 1/2" Doz.....2.20	1/16 sq.5.35
1 x 66 each.....1.99	2" Doz.....2.23	1/16 sq.5.40
1 x 67 each.....2.02	1 1/2" Doz.....2.26	1/16 sq.5.45
1 x 68 each.....2.05	2" Doz.....2.29	1/16 sq.5.50
1 x 69 each.....2.08	1 1/2" Doz.....2.32	1/16 sq.5.55
1 x 70 each.....2.11	2" Doz.....2.35	1/16 sq.5.60
1 x 71 each.....2.14	1 1/2" Doz.....2.38	1/16 sq.5.65
1 x 72 each.....2.17	2" Doz.....2.41	1/16 sq.5.70
1 x 73 each.....2.20	1 1/2" Doz.....2.44	1/16 sq.5.75
1 x 74 each.....2.23	2" Doz.....2.47	1/16 sq.5.80
1 x 75 each.....2.26	1 1/2" Doz.....2.50	1/16 sq.5.85
1 x 76 each.....2.29	2" Doz.....2.53	1/16 sq.5.90
1 x 77 each.....2.32	1 1/2" Doz.....2.56	1/16 sq.5.95
1 x 78 each.....2.35	2" Doz.....2.59	1/16 sq.6.00
1 x 79 each.....2.38	1 1/2" Doz.....2.62	1/16 sq.6.05
1 x 80 each.....2.41	2" Doz.....2.65	1/16 sq.6.10
1 x 81 each.....2.44	1 1/2" Doz.....2.68	1/16 sq.6.15
1 x 82 each.....2.47	2" Doz.....2.71	1/16 sq.6.20
1 x 83 each.....2.50	1 1/2" Doz.....2.74	1/16 sq.6.25
1 x 84 each.....2.53	2" Doz.....2.77	1/16 sq.6.30
1 x 85 each.....2.56	1 1/2" Doz.....2.80	1/16 sq.6.35
1 x 86 each.....2.59	2" Doz.....2.83	1/16 sq.6.40
1 x 87 each.....2.62	1 1/2" Doz.....2.86	1/16 sq.6.45
1 x 88 each.....2.65	2" Doz.....2.89	1/16 sq.6.50
1 x 89 each.....2.68	1 1/2" Doz.....2.92	1/16 sq.6.55
1 x 90 each.....2.71	2" Doz.....2.95	1/16 sq.6.60
1 x 91 each.....2.74	1 1/2" Doz.....2.98	1/16 sq.6.65
1 x 92 each.....2.77	2" Doz.....3.01	1/16 sq.6.70
1 x 93 each.....2.80	1 1/2" Doz.....3.04	1/16 sq.6.75
1 x 94 each.....2.83	2" Doz.....3.07	1/16 sq.6.80
1 x 95 each.....2.86	1 1/2" Doz.....3.10	1/16 sq.6.85
1 x 96 each.....2.89	2" Doz.....3.13	1/16 sq.6.90
1 x 97 each.....2.92	1 1/2" Doz.....3.16	1/16 sq.6.95
1 x 98 each.....2.95	2" Doz.....3.19	1/16 sq.7.00
1 x 99 each.....2.98	1 1/2" Doz.....3.22	1/16 sq.7.05
1 x 100 each.....3.01	2" Doz.....3.25	1/16 sq.7.10
1 x 101 each.....3.04	1 1/2" Doz.....3.28	1/16 sq.7.15
1 x 102 each.....3.07	2" Doz.....3.31	1/16 sq.7.20
1 x 103 each.....3.10	1 1/2" Doz.....3.34	1/16 sq.7.25
1 x 104 each.....3.13	2" Doz.....3.37	1/16 sq.7.30
1 x 105 each.....3.16	1 1/2" Doz.....3.40	1/16 sq.7.35
1 x 106 each.....3.19	2" Doz.....3.43	1/16 sq.7.40
1 x 107 each.....3.22	1 1/2" Doz.....3.46	1/16 sq.7.45
1 x 108 each.....3.25	2" Doz.....3.49	1/16 sq.7.50
1 x 109 each.....3.28	1 1/2" Doz.....3.52	1/16 sq.7.55
1 x 110 each.....3.31	2" Doz.....3.55	1/16 sq.7.60
1 x 111 each.....3.34	1 1/2" Doz.....3.58	1/16 sq.7.65
1 x 112 each.....3.37	2" Doz.....3.61	1/16 sq.7.70
1 x 113 each.....3.40	1 1/2" Doz.....3.64	1/16 sq.7.75
1 x 114 each.....3.43	2" Doz.....3.67	1/16 sq.7.80
1 x 115 each.....3.46	1 1/2" Doz.....3.70	1/16 sq.7.85
1 x 116 each.....3.49	2" Doz.....3.73	1/16 sq.7.90
1 x 117 each.....3.52	1 1/2" Doz.....3.76	1/16 sq.7.95
1 x 118 each.....3.55	2" Doz.....3.79	1/16 sq.8.00
1 x 119 each.....3.58	1 1/2" Doz.....3.82	1/16 sq.8.05
1 x 120 each.....3.61	2" Doz.....3.85	1/16 sq.8.10
1 x 121 each.....3.64	1 1/2" Doz.....3.88	1/16 sq.8.15
1 x 122 each.....3.67	2" Doz.....3.91	1/16 sq.8.20
1 x 123 each.....3.70	1 1/2" Doz.....3.94	1/16 sq.8.25
1 x 124 each.....3.73	2" Doz.....3.97	1/16 sq.8.30
1 x 125 each.....3.76	1 1/2" Doz.....4.00	1/16 sq.8.35
1 x 126 each.....3.79	2" Doz.....4.03	1/16 sq.8.40
1 x 127 each.....3.82	1 1/2" Doz.....4.06	1/16 sq.8.45
1 x 128 each.....3.85	2" Doz.....4.09	1/16 sq.8.50
1 x 129 each.....3.88	1 1/2" Doz.....4.12	1/16 sq.8.55
1 x 130 each.....3.91	2" Doz.....4.15	1/16 sq.8.60
1 x 131 each.....3.94	1 1/2" Doz.....4.18	1/16 sq.8.65
1 x 132 each.....3.97	2" Doz.....4.21	1/16 sq.8.70
1 x 133 each.....4.00	1 1/2" Doz.....4.24	1/16 sq.8.75
1 x 134 each.....4.03	2" Doz.....4.27	1/16 sq.8.80
1 x 135 each.....4.06	1 1/2" Doz.....4.30	1/16 sq.8.85
1 x 136 each.....4.09	2" Doz.....4.33	1/16 sq.8.90
1 x 137 each.....4.12	1 1/2" Doz.....4.36	1/16 sq.8.95
1 x 138 each.....4.15	2" Doz.....4.39	1/16 sq.9.00
1 x 139 each.....4.18	1 1/2" Doz.....4.42	1/16 sq.9.05
1 x 140 each.....4.21	2" Doz.....4.45	1/16 sq.9.10
1 x 141 each.....4.24	1 1/2" Doz.....4.48	1/16 sq.9.15
1 x 142 each.....4.27	2" Doz.....4.51	1/16 sq.9.20
1 x 143 each.....4.30	1 1/2" Doz.....4.54	1/16 sq.9.25
1 x 144 each.....4.33	2" Doz.....4.57	1/16 sq.9.30
1 x 145 each.....4.36	1 1/2" Doz.....4.60	1/16 sq.9.35
1 x 146 each.....4.39	2" Doz.....4.63	1/16 sq.9.40
1 x 147 each.....4.42	1 1/2" Doz.....4.66	1/16 sq.9.45
1 x 148 each.....4.45	2" Doz.....4.69	1/16 sq.9.50
1 x 149 each.....4.48	1 1/2" Doz.....4.72	1/16 sq.9.55
1 x 150 each.....4.51	2" Doz.....4.75	1/16 sq.9.60
1 x 151 each.....4.54	1 1/2" Doz.....4.78	1/16 sq.9.65
1 x 152 each.....4.57	2" Doz.....4.81	1/16 sq.9.70
1 x 153 each.....4.60	1 1/2" Doz.....4.84	1/16 sq.9.75
1 x 154 each.....4.63	2" Doz.....4.87	1/16 sq.9.80
1 x 155 each.....4.66	1 1/2" Doz.....4.90	1/16 sq.9.85
1 x 156 each.....4.69	2" Doz.....4.93	1/16 sq.9.90
1 x 157 each.....4.72	1 1/2" Doz.....4.96	1/16 sq.9.95
1 x 158 each.....4.75	2" Doz.....4.99	1/16 sq.10.00
1 x 159 each.....4.78	1 1/2" Doz.....5.02	1/16 sq.10.05
1 x 160 each.....4.81	2" Doz.....5.05	1/16 sq.10.10
1 x 161 each.....4.84	1 1/2" Doz.....5.08	1/16 sq.10.15
1 x 162 each.....4.87	2" Doz.....5.11	1/16 sq.10.20
1 x 163 each.....4.90	1 1/2" Doz.....5.14	1/16 sq.10.25
1 x 164 each.....4.93	2" Doz.....5.17	1/16 sq.10.30
1 x 165 each.....4.96	1 1/2" Doz.....5.20	1/16 sq.10.35
1 x 166 each.....4.99	2" Doz.....5.23	1/16 sq.10.40
1 x 167 each.....5.02	1 1/2" Doz.....5.26	1/16 sq.10.45
1 x 168 each.....5.05	2" Doz.....5.29	1/16 sq.10.50
1 x 169 each.....5.08	1 1/2" Doz.....5.32	1/16 sq.10.55
1 x 170 each.....5.11	2" Doz.....5.35	1/16 sq.10.60
1 x 171 each.....5.14	1 1/2" Doz.....5.38	1/16 sq.10.65
1 x 172 each.....5.17	2" Doz.....5.41	1/16 sq.10.70
1 x 173 each.....5.20	1 1/2" Doz.....5.44	1/16 sq.10.75
1 x 174 each.....5.23	2" Doz.....5.47	1/16 sq.10.80
1 x 175 each.....5.26	1 1/2" Doz.....5.50	1/16 sq.10.85
1 x 176 each.....5.29	2" Doz.....5.53	1/16 sq.10.90
1 x 177 each.....5.32	1 1/2" Doz.....5.56	1/16 sq.10.95
1 x 178 each.....5.35	2" Doz.....5.59	1/16 sq.11.00
1 x 179 each.....5.38	1 1/2" Doz.....5.62	1/16 sq.11.05
1 x 180 each.....5.41	2" Doz.....5.65	1/16 sq.11.10
1 x 181 each.....5.44	1 1/2" Doz.....5.68	1/16 sq.11.15
1 x 182 each.....5.47	2" Doz.....5.71	1/16 sq.11.20
1 x 183 each.....5.50	1 1/2" Doz.....5.74	1/16 sq.11.25
1 x 184 each.....5.53	2" Doz.....5.77	1/16 sq.11.30
1 x 185		

monthly contest of the P.M.A.A. at Philadelphia. Micott experienced difficulty in finding the right spot from which to launch his class B R.O.W., but on his third flight he got it off for 8 minutes, 15 seconds to capture first prize in that event.

"Matten had trouble adjusting his plane, a Class "B" R.O.G., and at the start of his third flight his motor stick broke, so he was forced to leave without having made a successful flight."

Connecticut

Donat Champagne, secretary of the Windham Model Aero Club, Y.M.C.A. Building, Willimantic, Conn., tells us that this club was formed last summer. He sends us a report of their activities:

"The first meeting was held in the early part of the summer and in subsequent gatherings, officers were elected and a constitution drawn up. The group showed much enthusiasm, so much that a contest was decided to be held.

"Being the first meet of the group which we called "The Windham Model Aero Club" there were countless details to be attended to. These were taken care of by the contest committee and the date set for Friday, August 20, to be held at the local "Recreation Park." We were blessed with ideal weather and the contest was a grand success. We awarded prizes to the following winners of the three events held:

A—Outdoor Stick Duration Event

1. A. T. Kusner.
2. D. Hunt.
3. B. Prague.

B—Outdoor Commercial Duration Event

1. D. Hunt.
2. A. Ogushowitz.
3. Leo Hobec.
4. Donald Willet.

C—Flying Scale Event

1. Roland Marrotte.

"Since David Hunt totaled more points than any of the other contestants, he was acclaimed "Willimantic Area Champion Flyer" for 1937.

"No sooner was the contest over when some members suggested that the club put on an exhibition at a local fair which was to be held a few days later. This seemed an excellent idea and we all rushed to get our models in shape for this. On the opening day of the fair we had just about completed our display of models which attracted much attention and netted the club a 'First Premium.'

"Now with the advent of cold weather the attention of the club members is turning 'indoors.' A number of the boys are working on their indoor 'crates' and it is very likely an indoor contest will be staged sometime in January or February.

"The club is not behind times, though: gas jobs are flying quite regularly and at the next state meet (if the commissioner allows it) the boys will be stiff competition, I assure you.

"The present officers of the club are as follows: President, Andrew Kusner; Vice-President, William Bacon; Secretary, Donat Champagne; Treasurer, George Cloutier; Adult Advisor Postmaster, James J. Lee.

"The club is very thankful to the adult advisor who was instrumental in obtain-

THE AIR CHIEF



IDEAL'S I. G. M. A. A. TROPHY WINNER



The Air Chief has flown over 20 minutes after motor was cut out!

61" wingspan, length 38"
weight 2½ lbs. without motor

The U.S.S. KEARSARGE
32" Model of the Famous Civil War Frigate

Complete kit including Carved Wood Hull, Cast Metal: Lifeboats, Ladders, Davits, Cannon, Anchor, Steering Wheel, Bitts, Chocks, 156 Metal Dead Eyes, Rigging Thread, Colored Lacquer, all needed parts plus full-size Plan.

\$7.50
Complete

The AIR CHIEF is scientifically designed, compactly planned to give perfect performance! The Double-Wing Dihedral feature gives fast climb, which means longer flights after motor is cut out! Its sturdy construction withstands landing shock... its fine, selected materials insure dependability. All tedious and difficult work is already done for you. Clear, easy-to-follow plans make construction easy as A-B-C. It's thrilling fun to fly the AIR CHIEF!

\$6.00

complete without motor. Equip with any standard miniature engine for thrilling powered flight! Kit includes Wood Cut to Size, Pneumatic Air Wheels, Formed Shock-Absorbing Landing Gear, Die-Cut Ribs, all needed parts.

SEND FOR COMPLETE CATALOG—10c

IDEAL AEROPLANE & SUPPLY CO., INC.

Famous for model aeroplanes since 1911

20-24 West 19th Street, New York

Pacific Coast Branch
Model Boat and Aircraft Company
1356 8th Ave., San Diego, Calif.

South Africa Distributor
70 Von Brandis,
Johannesburg, S. A.

ing the park for the August contest and publicizing the meet. The club workshop was also set up through Mr. Lee who has proven himself to be an ideal adult advisor."

Correspondents

The following boys have requested their names to be added to the "Correspondence" list:

Clayton C. Fracker, 620½ Market Street, Zanesville, Ohio.

L. Rijdsdijk, Lage Oostzeedijk 29a, Rotterdam-Oost, Holland.

Edward A. Zahn, 29 Salisbury Avenue, Stewart Manor, New York.

Rex Bixby, 1727 North Serrano Street, Hollywood, California.

Gas Lines

(Continued from page 23)

the motor rocks. Springs on either side of the motor take up the shock. It has proven itself to be very satisfactory during tests. The motor is a model "B" Brown Junior. The entire ship weighs seven pounds, ready to fly.

Mr. Ramsey wishes some suggestions concerning its design and adjustment before he makes test flights. We venture the following information:

Where the line of thrust is high, as in this case, it is advisable to mount the motor so that the line of thrust is parallel with the chord of the wing. The stabilizer should have approximately three degrees negative incidence relative to the line of thrust. That is, the angle between the line of thrust and the chord of the sta-

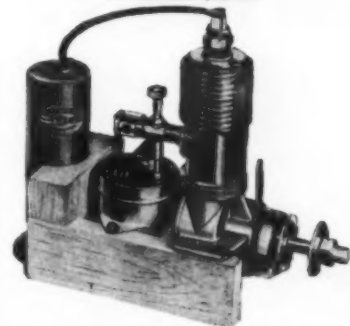


Leading Pilots and Designers recommend

BROWN JR. MOTORS

C-Model \$17.00

B-Model \$21.50



1/5 H.P. Weight, bare, 6½ oz.
Height 4¾ inches. Length 5¾ inches.
R.P.M. range 1,200 to 10,000

Power your model with a Brown Jr.—the motor that leading pilots and designers recommend for its performance and reliability. "B" and "C" Models fully guaranteed. Ask your dealer to show you the special gas tank that prevents stalling on steep climbs. And see the many other features that make this motor the leader in the field.

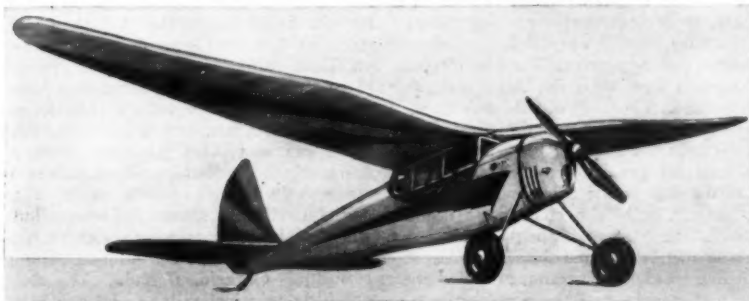
Sold by leading dealers.



NOTHING BUT A "HUSKY JR." FOR US—SAY MODEL BUILDERS FROM COAST TO COAST

ANOTHER TRIUMPH FOR DOUGLAS-DESIGN IN THE NEW EASY TO BUILD—"DOUGLAS E-GULL"—GAS MODEL

The model pictured has made 42 perfect flights—it's "Husky" powered, a super design without a parallel—you owe yourself the thrill of flying tomorrow's gas model today!



WINGSPAN 69" WT. 2 1/2 LBS. FULL SIZE DRAWING. All Wing Ribs and Body Formers Cut to Shape and Notched—Rudder, Elevator and Wing Tips Cut to Shape—Special Cowl—Pen Cell Holder—Switch—Plug & Jack—Bracket for Elevator—Strips Cut to Size—Landing Gear Shaped—M & M Wheels—Silk—Dope—Glue—Masking Tape—Celluloid Sheet—Nothing Else to Buy—Color Yellow and Red Trimming.

COMPLETE KIT INCLUDING SILK COVERING.....\$8.50 (Add 35c Postage)
INCLUDING BAMBOO PAPER COVERING.....\$7.50 (Add 35c Postage)

SEND FOR BIG NEW CATALOG—MAILED FREE

Dealers write for discounts

Send Money Orders or CASH only. When sending cash fasten coin to letter with adhesive tape. If located in Washington add State Tax.

DOUGLAS MODEL AIRCRAFT CO. 1400 North 45th St., Dept. C, Seattle, Wash., U. S. A.

kin at 4112 Cambridge Street, Philadelphia, Pa.

Mr. Gerard Rauch of Cresskill, New Jersey, P.O. Box 529, sends us picture No. 6, showing his very unusual and interesting model. It has the general lines of a KG with the motor mounted on top of the wing. He says it took two months to build at a cost of \$15. The fuselage is of monocoque construction and the plane, ready to fly, weighs seven pounds. The power is supplied by a Brown Junior. The test flights proved this model to be very stable, the longest one being two minutes, twenty-three seconds, on a forty-five second motor run. One of the advantages of placing the motor in the position shown in the picture is that the center of gravity is easily kept at a point which is a parallel line with the center of lateral area.

Mr. Robert Strader of 817 Westcott Street, Syracuse, New York, sends a picture, No. 7, of himself with his 10 foot, 4 inch Nimbus gas model, plans for which appeared in a past issue of MODEL AIRPLANE NEWS. He says the job was powered by a Brown Junior which swung a fifteen inch propeller. Unlike the original design, due to a lack of proper material, the fuselage was constructed with longerons and stringers. A steep climb and a beautiful glide were outstanding features of the ship. The wing was made in two pieces, joined at the center with four lightweight bolts. Strader says:

"The reason for the excessive use of the past tense is the fact that a concrete pole got in the way of the job while gliding in with a ten mile tail wing. The entire fuselage was shattered."

Mr. Strader is secretary of the Syracuse Model Airplane Club which has been very active, even during the winter. He tells us:

"The Syracuse airport officials have kindly permitted us to fly every morning

before 9 A.M. and each Sunday at 5:45 A.M., weather permitting. Though this is an unusually early hour, Syracuse's early risers have been astounded to see a truck full of gas jobs and a 'dawn patrol' headed for the airport."

There does seem to be a way of flying gas jobs so that they will not interfere with regular airport traffic. We thank Mr. Strader for his kind illustration of how to "get around" a difficulty which has been enlarged beyond all normal proportions by people who, in many cases, lack gas model experience. We also wish to thank the airport officials for permitting this flying.

We have news from the very active Albuquerque Gas Model Association of 406 South Arno Street. Mr. Lee Erlandson, secretary-treasurer of the Association, sends us a report of activities. He says:

"Picture No. 8 shows four of the club members, with their models, in front of the hangar on the field where they carry on their activities."

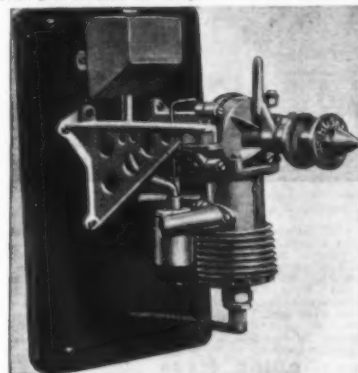
"Since July the club has had many small, informal contests and two large ones."

"Prizes were given at all of these, financed from the club treasury. The local Y.M.C.A. has kindly let us have a room 2 evenings a month in which to hold our meetings. At the last meeting we elected our President and Vice-president for the first 6 months of 1938. They are Lee Erlandson and Jim Thompson respectively. The Secy.-Treasurer will be elected next meeting."

"The club is planning to have aviation picture shows about once every 2 meetings for entertainment. These films are obtained from the Government."

The Gas Model Airplane Association of Southern California, with headquarters at 1406 West 105th Street, Los Angeles, Calif., has been exceedingly active, as

EXCLUSIVE FEATURES Found only in a HUSKY JR. "VANISIL" ALLOY (PAT.) PISTONS and RINGS are most RESISTANT TO WEAR of any other Alloys and POSITIVELY will NOT SCORE cylinder walls, insuring PERFECT COMPRESSION and CONSTANT POWER at all temperatures. "VANISIL" Disappears heat so Rapidly, the HUSKY JR. never overheats. The HUSKY JR. runs 20 minutes on two pen cells. The more you run your HUSKY JR. the better it runs; they just refuse to lose their compression or show the slightest signs of wear. Order your HUSKY JR. today.



Bore 5/8", Stroke 5/8", Wt. 9 oz.

Speed 250 to 10,000 R.P.M. The Husky Jr. Runs INVERTED or UPRIGHT as you wish. Each motor is THOROUGHLY TESTED, RUN IN and FULLY GUARANTEED. Price complete ready to run (less motor mounts, batteries and prop.), Postpaid.....**\$12.50**
Husky Jr. motor mounts, wt. 2 1/2 oz., per pr., postpaid.....50c
Husky Jr. "Non Brittle" prop. 1 1/2" each, postpaid.....\$1.00
Wt., ready to run, 9 oz., including coil, condenser, gas tank and two pen cells for current.

THE BEST ENGINES

On The Market Depend For
Their Performance On A
GOOD IGNITION COIL

The following manufacturers protect their reputation by using the best coil available.

A.J.C.

BABY CYCLONE

BEE

BRAT

CONDOR

HUSKY JUNIOR

LITTLE DYNAMITE

MADEWELL MITE

METEOR

MORTON CHALLENGER

OHLSSON

PEE WEE

TROJAN



You too can benefit from their experience by replacing with the genuine article.

New primary terminals, mounting brackets and fibre strap, clip connectors on lacquered high-tension wire, weight 2 1/2 oz.

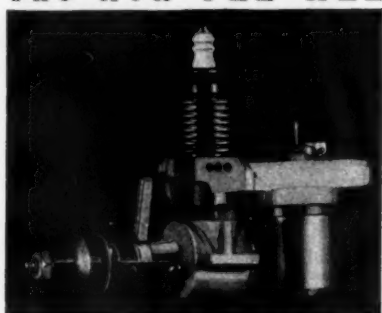
Price \$2.50

Comply with the new N.A.A. rules by using our reduced weight timer. Only 1 1/2 oz.—with switch. The lightest complete timer on the market. Time period of 1 min.....**\$3.00**
Three or five minutes.....**\$3.50**



NATHAN R. SMITH MFG. CO.
1814 West 8th St., Los Angeles, Calif.

The New PEE WEE



Here is the smallest engine on the market, a 2 cycle, 4 port, air-cooled gasoline engine. Check these specifications:
Bore— $\frac{1}{8}$ " Stroke— $\frac{9}{16}$ " Weight— $7\frac{1}{2}$ oz. complete with coil and 1 penlite battery. Height— $3\frac{1}{2}$ " overall. Length— $4\frac{1}{2}$ " overall. Speed—3500 R.P.M. with 16" propeller. Runs 8 to 12 minutes on $\frac{1}{4}$ oz. of fuel. Cylinder and Piston—Cast iron. Crankshaft—Machined from solid bar drill rod. Main Bearing—High speed bronze. Crankcase and Carburetor—Aluminum alloy sand casting. Gas Tank—Integral with motor; machined from solid bar aluminum. Bottom cone shaped. Good to the last drop. Spark Plug—Champion, $\frac{1}{8}$ "—24 S.A.E. thread. Coil—Special. Operates on 1 penlite battery.

PRICE \$14.50 Postpaid

Assembled and factory tested. Complete with coil, ready to run.

DALLAIRE MODEL AIRCRAFT CO.
10140 Cruslaw Ave., Detroit, Mich.

PONTOONS



**FEATHER WEIGHT MOULDED
PONTOONS, BEAUTIFULLY FINISHED
AND DESIGNED FOR PERFORMANCE**

These floats will add a realistic appearance and performance that will thrill the most exacting model builders.

10"	$\frac{1}{6}$ oz.	\$.65 ea.	\$1.10 pr.
12"	$\frac{3}{10}$ "	.75 "	1.35 "
14"	$\frac{4}{10}$ "	.95 "	1.65 "
16"	$\frac{6}{10}$ "	1.25 "	1.95 "

All Orders Postpaid
Send for Float Bulletin

MODEL PLASTIC MFG. CO.

19211 Havana Ave. Detroit, Michigan

\$1.00 Plus 20c Postage

54" STINSON Gull Wing

Turned Balsa Nose—Balsa Balloon Wheels—Finished Propeller—Simplified Construction—Extra Large Bottle of Cement and Dope—Full Size Plan—Large Bundle of Strips—Sheet Wood—Printed Sheets—and plenty of everything to construct this **GUARANTEED GIANT FLYER**. Packed in a 30" Box.

WANTED

JOBBERS and DISTRIBUTORS: Be among the first to cash in on the sales that will flow your way thru this amazing kit. The first of a complete series of giant flyers. Write at once and secure the distributorship in your locality. Please write in on your **LETTER-HEAD** for complete and attractive discounts we are prepared to offer you.

MANUFACTURED AND DISTRIBUTED BY

CAPITOL AIRCRAFT SUPPLIES

113 Blake Ave., Brooklyn, N. Y.

usual. Mr. Frank B. Knapton, secretary, and one of the leaders in this state, has kindly sent us pictures No. 9 and No. 10.

Picture No. 9 is an aerial view of the contest which was held on December 19th, 1937, in full swing. From the picture one is impressed by the order in which the contest facilities have been arranged. As you see, there are regular parking places for the cars though only a few of them are shown in the picture. The pits for the gas models and their builders may be clearly seen. The line of pits was about 900 feet long. At the upper right corner may be seen the starting circle, which is also used for precision landings.

"On the day of the contest the weather was perfect, a bright clear day; not a cloud in the sky and no thermols. A large crowd, estimated by newsmen at from five to eight thousand, attended the meet and nearly two thousand automobiles were parked on the lot. Two hundred and twenty-three entrants from all over the state attended. The pits were laid out three deep. Over fifty officials handled their various assignments with a minimum amount of effort. No confusion, bickering or squabbling resulted.

"Competition was very keen, as the rules of the contest called for each ship to be wing-loaded twelve ounces to the square foot, same to be built into the ship. Each ship was given two flights, only the best flight to be considered. Motor time was limited to thirty-five seconds and points were at the rate of one point a second for the duration of the flight.

"Two hundred and twenty-three ships were on the starting line and turned in three hundred and seven official flights. Of course several contestants were left at the post as was expected at a meet of this kind. The first ship left the line at eight o'clock in the morning and the last shortly after two. Several ships were in the air at all times and the spectators were given a run for their money when two ships crashed in the air. One ship, owned by Henry Stiglmeir, was a complete washout. Henry had carefully groomed his ship for this event and it was conceded a good chance to get in the money.

"The club put up eighty dollars in cash and three trophies. In addition to this we gave away over ninety merchandise prizes which were donated by various model shops throughout the country.

"This association has its own field under lease and it is known as The Gas Model Airport. We operate our public address system and our own concessions. Rigid rules are enforced for the protection of the ship owner as well as the spectator. Not one accident was reported to our first-aid station during the entire meet, and only a very few ships went out of the field.

"The winners were:

First place—J. P. Young, Lemoore, Calif.

Second—R. Brashear, Long Beach, Calif.

Third—Ray M. Snow, Fresno, Calif.

Fourth—Donald Cummings, Los Angeles, Calif.; and

Fifth—John Berg, Los Angeles.

Entries came from as far north as San

Francisco and as far south as San Diego.

"Our next Contest is set for June 12, 1938, when we have every assurance that we will have five hundred ships entered."

Picture No. 10 shows a thirty-six inch gas job, powered with a small bore gas model engine. This is a very unique little job and illustrates well how it is possible to build gas models of small wing span. It flew well enough at the contest on December 19th to capture eleventh place. In a field of several hundred builders this is very remarkable. California model experts are very adept at building small gas models of this type. Properly designed, these ultra-small ships can be made to fly as well as large ones.

Picture No. 11 shows a Curtiss Robin gas model on floats which was built by Donald Kilpatrick of 2 Louisa Avenue, Hamilton, Ontario, Canada. The floats are forty-two inches long and are home-made. They are twin-stepped and weigh only six ounces each. This model has flown very successfully; in fact, so much so, that Kilpatrick is now designing and building a high-wing amphibian.

Most gas model builders are familiar with the name and work of the young man shown in picture No. 12. He is Maxwell Bassett of 11th Street & 66th Avenue, Oak Lane, Pa., with one of his latest creations. Maxwell has been an ardent advocate of smaller gas models. He has, you will see, put his beliefs into practice. This is one of the first diminutive gas models he has built. It has a forty-six inch wing spread and weighs one pound, two ounces, ready to fly. For ignition he uses two pen light cells quite successfully. The wing loading is approximately the same as larger planes, hence has just as good a glide. As regards stability, the little plane seems to be more stable than planes of large dimensions of similar design. However, Bassett says that he has not tested the machine thoroughly enough as yet to determine its exact characteristics. He does not say what motor he is using. However, we believe it to be a special motor with fairly high power, for he says the climb is exceptional because of the relation of the motor and plane sizes.

Former I.G.M.A.A. Units News

The reports of activities of the following clubs was received before the merger of the I.G.M.A.A. and N.A.A. Most of these are now taking steps to become members of the new N.A.A. Gas Model Division.

Michigan

Wayne Crawford of Jackson, Michigan, R.F.D. No. 8, secretary-treasurer of the Jackson Gas Model Club, I.G.M.A.A. Unit 52, sends us a few items concerning his club. They are:

"Members of Unit 52 elected officers June 21 and results are as follows: President, Pete Dillon; vice-president, Martin Van-Buren; secretary-treasurer, Wayne Crawford.

"The Jackson unit now has 10 members and more than 13 planes of which some are of original design. We expect to have new members as soon as they buy either a motor, a construction kit or both.

"A gas model contest was scheduled to be held June 27th at Marshall, Michigan, from 9:00 to 12:00 A.M. Members of the Jackson club intending to go gathered at our regular meeting place at 7:30 A.M. We carefully crated the five gas models to be taken and loaded them in our trailer and thence started for Marshall.

"All was well until the crates fell out of the trailer several miles outside of Jackson. Every wing had from one to two feet of one wing tip clipped off, and one fuselage was nearly cut in two by a wire. Despite the bad luck we continued the trip.

"Several hours were spent repairing the broken structures; then to our surprise we captured first and third prizes. A happy ending to a sad beginning."

NOTICE

J. G. Pritchard, leader of unit 64, the State City Gas Model Association of Bangor, Pa., writes the following:

"I wish to report a fellow club member's lost gas model. The plane was lost from Northeast Airport in Philadelphia at the recent gas model meet held there. The plane is a 7-foot modified Turner Special powered with a Mighty Midget engine. The ship has yellow wings and tail surfaces and a blue fuselage. The license number was I.G.M.A.A. 64-12-1. The motor number was MX13D. The owner is Walter Deshler Jr., Phillipsburg, New Jersey. Please notify him if the model is found."

Mr. Barton Murray, W8ANU & W8PME, of Bethany, West Virginia, Box 88, is intensely interested in radio. He noted an omission in Mr. Leo Weiss' recent article in MODEL AIRPLANE NEWS on radio control which he believes should be brought to the attention of all those building radio-controlled gas models. It is:

"The Federal Communications Commission will not permit the operation of ANY type of radio transmitter without the operator holding a valid operator's license. Having been a licensed Amateur Radio Operator for years I am in a position to be certain about this statement."

In Glendale, California, some of the gas model builders have organized a club called the Western Gas Model Airplane Association. The club has just started to grow to a good size, but they have had monthly contests since last summer. In each contest about fifteen ships entered. Contests are run as limited engine events with additional points for design, workmanship, take off, climb, glide and landing. Garner Summers, the leading contestant, holds the club record of two minutes, 31 seconds, on a thirty second motor run. They have a field of their own only a few miles from Glendale and many of the members can be found there every Sunday morning flying their gas jobs.

Any gas modelers in or around Glendale who would like to join should communicate with the club secretary, Don Petersen at 1450 Idlewood Road, Glendale, Calif. Everyone is cordially invited to join.

The Trenton Aero Society of 212 Centre Street, Trenton, New Jersey, send us the following notice:

NEW—1938—HIGH-EFFICIENCY "K-5" MODELS

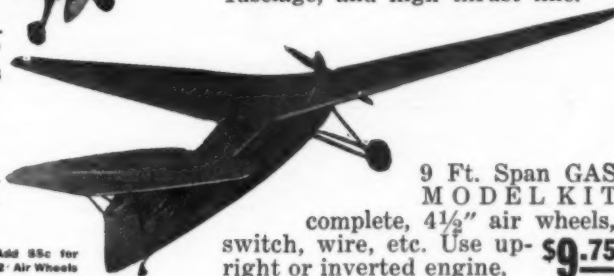


54" Span PEE-
WEE KIT
complete, less
engine

\$3.95

54" Span RUB-
BER KIT com-
plete

\$2.50 Add 85c for
2" Air Wheels



9 Ft. Span GAS
MODEL KIT
complete, 4 1/2" air wheels,
switch, wire, etc. Use up-
right or inverted engine. **\$9.75**

FEATURES—Exclusive "T" section tail, proven more effective, especially at low speeds and high angles of attack. Rudder and stabilizer can not "Blanket out" each other.—Highly tapered wing for greatest inherent stability, least induced drag, resulting in faster climb and higher ceiling with less power.—Superior Gliding Angle due to minimum parasite drag, well rounded, fully streamlined fuselage.—Adjustable tabs on Rudder, Stabilizer, and wings.—Landing gear and tail wheel are fully shock-absorbing.—Detachable wings "Give" in a collision.—Rounded fuselage easily made without formers.—Simplified straight taper wing is easy to build.—Models correctly designed by an Aeronautical Engineer.—Simplified and Proven model construction by an experienced Gas model builder.—Months of testing, plus proven refinements assure your complete success. **KITS ARE COMPLETE.** All materials for constructing models as pictured are furnished, including printed balsa ribs, full size detailed plans with pictures, clear notes and instructions, Tissue, dope, cement, banana oil, celluloid, wheels, and propeller.—Foreign Orders, Add 20%.—**DEALERS AND CLUBS WRITE FOR ATTRACTIVE PROPOSITION.**—Complete Gas model plans and instructions—\$1.50—Deductible from Kit purchase price (less plans) if bought within 10 days.—PEE WEE, \$1.00.—RUBBER plans, 75c.—NOTE: All prices and specifications subject to change without notice.

The KORFF Co.,

19 W. South St.

Indianapolis, Indiana

"At a recent meeting of our N.A.A. Chapter a date was decided upon for the Second Annual Trenton Eastern States Gas Model Meet. This will be held at the spacious Mercer Airport where last year's meet was so successfully held.

"The contest is scheduled for Sunday, August 21, 1938. We wish you would publish this date in your magazine so as to attempt to avoid having another club's calendar conflict with ours.

"The Luscombe Aircraft Co. and the John A. Roebling Co. have both shown intentions of offering perpetual trophies as their share of promoting the meets in Trenton. These will be given along with a permanent miniature as well as cash as first prizes. As usual there will be other numerous prizes for second and third, etc., places."

Correction

In listing the winners at the California State Champion Model Airplane Contest held September 6th and 7th, 1937, we printed the wrong names. The correct winners are:

Richard Schumacher, of San Francisco, won the gas event and Nick Sanford, of San Francisco, won the compressed air event. In the rubber powered flying scale event, major division, Charles "Will" Collins of 324 Capitol Street, Vallejo, Calif., was first. Richard Schumacher also won the minor division of the event, with Henry Asera second.

THREE WISE MEN
(hundred)
300
Young men are enrolled
now at CURTIS-
WRIGHT TECH
training for their
future

YOU must train for your future

The Untrained Man Hasn't A Chance—The completely trained man has all the odds in his favor—you can enjoy the good things of life provided you are properly prepared—Curtis-Wright Tech's great name, prestige and long years of experience guarantees you the finest training in the world. Because of Curtis-Wright Tech's distinguished reputation and years of experience in successfully training young men for aeronautical careers, there is a constant waiting list of employers for Curtis-Wright Tech graduates. Consequently there is no indefinite period after graduation when you will be "looking for a job." You will start earning at once. Your Curtis-Wright Tech training will insure your future prosperity since you will have the necessary preparation to command higher salaried positions and win rapid advancement. Curtis-Wright Tech's two major courses, **Aeronautical Engineering** and **Master Mechanic**, are complete career courses with all non-essentials eliminated. These courses are carefully planned to train you in advance for the highest position you ever expect to occupy. Train in the heart of the aircraft industry in Sunny Southern California, on famous Grand Central Air Terminal, a three million dollar airport. Study the coupon below, select the course you want and mail this handy coupon today for full information. Don't train and you will be a failure—Train with Curtis-Wright Tech and be a success.

BE WISE—PROTECT YOUR FUTURE

CURTIS-WRIGHT TECHNICAL INSTITUTE
Grand Central Air Terminal, Sunny Southern California
Director, Major C. C. Shultz, President
200 California College Building, Los Angeles, California
Information in the section I have checked.

MAJOR CAREER COURSES

☐ AERONAUTICAL ENGINEERING ☐ MASTER MECHANICS

SUPPLEMENTARY COURSES

☐ POST GRADUATE ENGINEERING ☐ AIRCRAFT SHOP METAL ☐ HOME STUDY SHIPBUILDING

NAME _____ Age _____ Date I Plan to Enroll _____

ADDRESS _____ CITY _____ STATE _____

CURTIS-WRIGHT TECHNICAL INSTITUTE
GRAND CENTRAL AIR TERMINAL
GLENDALE, LOS ANGELES, CALIFORNIA

CLASSIFIED DIRECTORY

Advertise in this directory for quick profitable results! Rate 10¢ per word. Minimum 20 words. REMITTANCES MUST ACCOMPANY ALL ADS FOR THIS DIRECTORY. Advertisements for the May issue must be in by March 10th.

MODEL AIRPLANES—KITS—SUPPLIES

LIMITED. Instruments or filling, streamlining. Designed for Balsa. Beaches all corners. Send 10¢ each. Chas. Smith, North Fifth, Hamburg, Penna.

DEALERS. Clubs, Schools: Send for low, complete wholesale list, including gas model supplies. Save money. Model Airplane Utility, 5307 New Utrecht Ave., Brooklyn, N.Y.

BROWN AERO RUBBER—Hodgman Rubber Company, 261 Fifth Avenue, New York City. Chicago office: 412 South Wells Street. Dealers and manufacturers only.

GASOLINE powered model airplane kits, new and rebuilt motors and supplies. Free list. Carl A. K. Eldredge, Jr., Clearwater, Fla.

SAVINGS on model airplane supplies. Write for free price list. Dealers, Clubs. Our discounts mean real profits. Waterbury Model Builders Supply, 131 Cherry Street, Waterbury, Connecticut.

NIGHTY THOR consistent gas model. Winner of several meets. Excellent for limited motor run contests. Write for particulars, photograph. Andy's Model Shop, 83 North Burgher Ave., Staten Island, N.Y.

SACRIFICE—Flight tested, ready to fly 6 ft. gas model, Brown Jr. B motor, airwheels, \$27.00. Pascale, 59-38 Flushing Ave., Maspeth, N.Y.

FINISHED Airplane & Boat Models. Special Contest models. Free Price List. Swallowcraft Shop, Box 23, Ellenboro, N.C.

NORTHWEST Gas Modelers. Big contests this summer. Get ready now. We stock all makes. Call on us or order by mail. Speedy service. Nordhoff & Moore, Hobby Craft Dept., Seattle, Wash.

FREE PREMIUM given with every price list sent. Send for yours now. Litwin Bros. Balsa Wood Co., 474 East 98th St., Brooklyn, N.Y.

GAS MODEL propellers designed to give more pull with less resistance; perfect balance, true pitch, high gloss oil-proof finish, 12" to 15", \$1.00 each. Specialty Manufacturing Company, Allen, Michigan.

GAS MODEL SPECIALTIES, 314 Second North St., Syracuse, N.Y. Free propellers, auto-knips, cowling, with every motor. Catalog—money saving, complete, free—Lists motors, kits, supplies.

ANNIVERSARY Sale. 10% discount on all material and free gift with every order. Send for free catalogue now. Time Limited! H & F Model Airplane Co., 459 Bristol St., Brooklyn, N.Y.

FREE! Gifts with our sensational 1938 price list. Astounding values. Just write American Aircraft Supply, 254 Cedar St., New Haven, Conn.

MODEL MOTORS repaired and overhauled. All makes. Send in motor for estimate. Douglas Motors, 7231 Lehmer Ave., Forest Park, Ill.

BEAUTIFULLY carved and finished laminated gas model propellers, guaranteed workmanship, true pitch, high efficiency. 9" 10"—75¢, 11" 12"—\$1.00, 13" 14"—\$1.50, 15" 16"—\$2.00. Potl Propellers, 1373 Brook Ave., N.Y.C.

DEALERS only. Our wholesale list will be sent to you on request. It beats all competition in price and quality. Amazing values. Capitol Aircraft Supplies, 113 Blake Ave., Brooklyn, N.Y.

ARC WELDER—Build strong landing gears, motor mounts, etc. Holders and welds. Complete \$1.00 p.p. Melvin Marian, Hastings, Nebraska.

AMERICAN MADE Gas Model Paper. It's better. Dealers write: List 3c. Balsa Plane Co., 1128 No. Center, Terre Haute, Indiana.

FULL SIZE PLANS for 381 Rubber and Gas Models, etc. 21 page list 10¢. Jones Co., Box 31, West Brighton, S.I., N.Y.

GAS MODEL Propellers any length. Pine 45¢; Gunwood 55¢. Postage 6¢ extra. Model Shop, 1929 Broadway, Denver, Colo.

MISCELLANEOUS

NEW Rivera Art Stamp. Seldom seen! World's largest triangular (Congo, Sudan, South Seas, Bicolors, memorials and many others. Only 3c with approvals. Cactus Junior Announcements, Box 1870-C, Tucson, Arizona.

Howes

**METAL
14 INCH**

ADJUSTABLE PROPELLER



DRESS UP YOUR GAS JOB with this queen of props and be ready for the next scale model contest.

ONE CRANK with this prop will turn your motor over 4 to 8 times. Incidentally, with a cold motor or flooded intake and cylinder you will find it quicker and easier starting.

SUITABLE ADJUSTMENT can be quickly and easily made on the blades.

PROPELLER will not break crankshaft in case of crackup. Prop fits motors with 1/4" shaft and is 14" in diameter.

Priced at \$3.00 each.

Howes

**ADJUSTABLE
PITCH PROPELLER**

Fairview Ave., STAMFORD, CONN.

How Big Shall My Gas Model Be?

(Continued from page 29)

and the efficiency of the propeller at this speed all must be known. The climb depends upon the relative values of these factors.

Because of the complication of this method of determining a gas model's performance, and the large chance for error in establishing the correct drag of the airplane, a simpler empirical system of performance estimation will be used here. By this means the actual rate of climb cannot be calculated, but high and low limits of gas model performance can be established, using data taken from actual performances of planes of known weights, areas and power. Thus you may determine the degree of performance and comparative rate of climb of any gas model within practical limits of size.

There are approximate but definite ratios of motor power to wing area which establish the low and high limits of size of a gas engine powered model. Suppose we consider some actual model planes as a practical basis for our calculations; ones with which most model builders are familiar.

A plane with a slow rate of climb is the KG (Designed by the author and the first one constructed by Joseph Kovel). This plane had a wing area of 10.5 square feet and was powered with a Brown Junior engine of rated 1/5 horsepower. The piston displacement is rated as 0.6 cubic inches. According to the rated power of this engine, the KG model has 52.5 square feet of wing area per horsepower. The comparatively large area causes a slow flying speed and a low rate of climb when the weight of the plane is comparable with its size. The average KG weighs between six and seven pounds. Of course the lighter a plane is compared to its wing area, (wing loading) the faster the rate of climb will be for any given area. A five-pound KG would climb faster than a seven-pound one.

Some planes have been built that have had 80 square feet of area per horsepower. These, however, have not been average planes, but rather ones of super-light flimsy construction and built for special contest requirements.

We may safely say that 70 square feet per horsepower is the highest practical limit of size for gas models. This means that the limit of size for an engine of 1/5 hp. should be 14 square feet of wing area if any climb under power is desired rather than a plane that must depend on "thermals" for climbing characteristics.

Now let us consider the lower limits of wing area employed on gas models. One of the smallest planes to be powered with a 1/5 hp. engine had a wing area of about 2.1 square feet. It was a 300 square inch wing area model powered with a Brown engine. Thus it had the equivalent of 10.5 square feet of wing area per horsepower.

Its rate of climb was very high but its glide was very poor indeed. Whereas the rate of climb of the plane with large area per horsepower is low and glide excellent, the rate of climb of the small area-high power plane is high and the glide is

very steep. Neither of these types are best suited for duration models. Such a model should have a fast climb and a flat gliding angle.

Under these conditions it is probable that the best type of model is one which lies somewhere between these two extremes just described. Experience bears out this assumption. As an example the case of a model Taylor Cub, which had a steep climb and a flat glide, will be taken. This plane had a wing area of 5 square feet and was powered with a 1/6 hp. engine. Probably a 1/5 hp. motor could be used without increasing its weight. Thus with the 1/6 hp. engine, this plane had 30 square feet of wing area per horsepower, and with the 1/5 hp. motor, 25 square feet per horsepower. However, this model had a wing with a very high lift wing section, the Grant X-8. Such a wing is the equivalent of one with a larger area and a section of lower camber such as the Clark Y. Six square feet of area using a Clark Y would be about the equivalent of five square feet of area with the Grant X-8 section. Thus if the model had a wing with the Clark Y and 6 square feet of area, it would have 36 square feet per horsepower.

Most of the contest models built for duration employ a wing area of about seven or eight square feet of wing area. Such models when employing a 1/5 hp. engine have between 35 and 40 square feet of wing area per horsepower.

Judging from experience this size of model appears to be such that: 1. the weight can be kept low; 2. the area is sufficient to provide fine gliding and soaring qualities, and, 3. the power, weight, area ratio is high enough to insure a fast rate of climb.

Of course the performance of a model can be increased by reducing its weight. Those who are expert in building light structures for the wing area involved have a distinct advantage. However a model with an average wing loading of 8 or 10 ounces per square foot of wing area, powered with a 1/6 or 1/5 horsepower engine, will perform best if its total wing area is about SEVEN to EIGHT square feet.

Any added climbing qualities that a model of this size may have will be due to other design characteristics such as; low drag due to fine streamlining, a high degree of stability which will keep it steadily on its flight course, and the degree of efficiency of the wing.

Thus the weight of a model with seven square feet of wing area and loaded to 9 ounces per square foot will weigh 63 ounces or about 4 pounds. This is close to the low weight limit for this size of plane.

We can see from the foregoing analysis that in general the performance is determined by the relationship between the three factors; power, wing area and the weight of the model. If the power or wing area of a model, or both are increased in any case, the flight capacity of the plane will be increased. If the weight of the model is increased the flight capacity will be decreased. Thus it is possible to develop a formula which will be a measure of the flight capacity (or performance) of any model at various engine speeds.

First we know that the flight capacity is inversely proportional to the wing load-

ing, or $\left(\frac{A}{W}\right)$, where (A) = sq. ft. of wing area and (W) lbs. of weight of model. We know also that the performance will be inversely proportional to the power loading, or $\left(\frac{P}{W}\right)$ where (P) represents the motor power. Therefore the formula for flight capacity or, in effect, flight duration, may be written: $\left(\frac{A}{W}\right) \times \left(\frac{P}{W}\right) = F$, the measure of performance. Combining the quantities, $F = \left(\frac{AP}{W^2}\right)$. In the formula (P) may be measured by cubic inches of piston displacement, times the revolutions per minute of the engine shaft. It then appears as:

$$F = K \frac{(R.P.M.) (A) (C_u)}{W^2}$$

Now in order to determine what the minimum value of (F) should be, (that is for a model that will have a level flight course with no climb) let us solve the formula for (F), when values for the other quantities are inserted that represent the characteristics of an actual plane. As an example we will take the KG gas model. This ship has a wing area of 10.5 square feet. When powered with a Brown Junior engine of (0.6) cubic inches piston displacement, and weighing seven pounds, it has a low steady climb. When the weight of this plane is nine pounds the climb is practically zero. Therefore if we insert these values, (A=10.5), (Cu=0.6), (W=9), and (R.P.M.)=4000, in the formula, the value of (F) obtained should be the minimum value that may be tolerated. Substituting, we have:

$$F = K \frac{4000(10.5)(0.6)}{81} = \frac{4000(6.3)}{81} = 311.2$$

Thus when F=311.2 the model has just enough power to keep it in level flight.

Cu for the Forster Brothers (1/3-

FLYING MODELS

12" Wing Span

Aerona
Corben Ace
Consolidated
Curtiss Pursuit
Douglas Observation
Fokker D-8
Hi Climber
Vultee V.I.A
Kinner Sportster
Lockheed Vega
Manoscoupe
Polish Fighter
Puss Moth

16" Wing Span

Cessna
Bellanca
Aerona
Manoscoupe
Taylor Cub
Endurance
Chester Racer
Curtiss Coupe
Vultee
Fleet Trainer
DeHavilland
Kitty Hawk
Wiley Post
Flying Vought
Ryan
Seaplane
Heath
C. Wright

20" Wing Span

Stinson S.R.B-G
Endurance
Manoscoupe 90-A
Aerona Low Wing
Taylor Cub
Cessna

Each Kit Complete

Northrop Pursuit
Stinson Reliant
Taylor Cub
Boeing P-12-E
Curtiss Falcon
Fokker D-7
Hell Diver
Sopwith Camel
Snad
Nieuport
S.E.5
Vought Corsair
Waco Biplane

Each Kit Complete

Curtiss Falcon
Boeing F4B4
Fairchild
Brown B3 Sportster
Aerona
English Puss Moth
Fokker D-8
Polish Fighter
Spad
Great Lakes Trainer
Spartan
Hawk
Curtiss Hawk
Mr. Mulligan
Farman
Winnie Mae
Consolidated
Boeing P-26-A

Dry Kits—No Cement

Bellanca
Rearwin
Hughes Northrop
Curtiss Robin
S.E.-5
Waco Custom

English Puss Moth

ALL OF THE ABOVE KITS.. 2 FOR 35¢
P.P. U.S.A.
Money With Order—No C.O.D.—Special Disc. To Dealers
Long-nosed tube cement 6c. Shipped with model kits only.

G. L. YOUNG

2405 2nd Ave. No.

Birmingham, Ala.

1/2) hp. engine=1.2. Cu for the
Baby Cyclone motor=0.42
(approximately)

If both sides of the equation are divided by a value of (40) for (K), the answer will be in more convenient terms. So then our formula will be:

$$F = \frac{(R.P.M.) A Cu}{40W^2}$$

The minimum value of (F) then will be (7.78).

Now let us determine the value of (F) that will represent a very high flight capacity or duration.

It is possible to build a model with the power and wing area of the KG that weighs only 4.0 pounds. Such a model represents the limit of lightness that may be attained with the engine and wing area used, under present structural practice. Therefore such a plane should give close to a maximum performance. Now if the values of this ship are substituted in the formula, the maximum value of (F) may be obtained. Substituting, we have:

$$F = \frac{4000(10.5)(0.6)}{40(16)} = 31.14$$

Therefore we may say that any plane which have a value of (F) that is over (7.78) will climb, and that the limit of climb or capacity for duration is approximately a value of, F=31.14.

Then the climbing and gliding capacity in still air may be measured by the values of (F) between (7.78) and (31.14).

It is evident therefore that it is advantageous from a flight standpoint to make the model as light as possible for any given power and wing area. However there is a limit to the weight minimum to which a plane can be built. We have assumed that our duration gas job will not weigh more than 4 pounds when the wing has 7 square feet of area and the power is supplied by a 1/5 hp. motor. This is reasonable and a good weight specification to work for. In fact this will prove to be easier than to build a plane the size of the KG that will weigh only 4.0 pounds.

Now let us investigate the flight capacity of a model with the specifications we have chosen. Substituting the values in the formula we have:

$$F = \frac{4000(7)(0.6)}{40(16)} = 26.25$$

This value of (F) is fairly close to (31.14) which is the assumed limit of flight capacity. If the weight of the model can be reduced from 4 pounds to 3.68 pounds it will have a flight capacity equal to the maximum assumed as practical, i.e. (31.14).

Thus the method of determining the performance quality of our duration model by means of the formula upholds the results obtained through practical analysis.

(The cubic inch displacement of a motor may be calculated by the following formula:

$$Cu = \frac{3DS}{4}, \text{ where } Cu = \text{cubic inch displacement; } D = \text{the piston diameter; and } S = \text{the stroke.}$$

The approximate horse power of any engine may be determined by means of the following formula:

$$(hp.) = \frac{(R.P.M.) Cu}{12000}$$

GREATEST BARGAIN

in 10 years



**Remington
NOISELESS
Portable**
Now 10c a day

**10¢
A
DAY**

Imagine a typewriter that speaks in a whisper! You can write in a library, a sick room, a Pullman berth, without disturbing others. And superb performance that literally makes words flow from the machine. The Remington Noiseless Portable is equipped with all attachments that make for complete writing equipment—it manifolds and cuts stencils perfectly. Furnished in black with chromium fittings.

SPECIFICATIONS

Standard keyboard. Takes paper 9.5 inches wide. Standard size, 12 yard ribbon. Makes up to 7 legible carbons. Back spacer. Paper fingers. Roller type. Black key cards with white letters. Double shift key and shift lock. Right and left carriage release. Right and left cylinder knobs. Large cushion rubber feet. Single or double space adjustment. A brand new NOISELESS typewriter, right off the assembly line.

10-DAY FREE TRIAL

For the first time in history you can own a genuine Remington Noiseless Portable for only 10c a day or \$3.00 a month. Think of it! The finest Remington Portable ever built at the lowest terms we have ever offered.

And you don't risk a penny! We will send this brand new Remington Noiseless Portable for a **TEN DAYS' FREE TRIAL!** If you are not satisfied, send it back. We pay all shipping charges.

FREE TYPING COURSE

With your Remington Noiseless Portable—absolutely free—a 19-page course in typing teaching you the Touch System, always used by experts. With the help of this course you will find typing the most enjoyable way you ever wrote.



FREE CARRYING CASE

Under this new purchase plan you also receive a **FREE Carrying Case**, handsomely covered in DuPont fabric. The case makes it easy to take your machine anywhere. You can use it on trains, or on your knees at home. Don't delay. Mail the coupon.



MAIL NOW

Remington Rand Inc., Dept. 226-4
465 Washington St., Buffalo, N. Y.

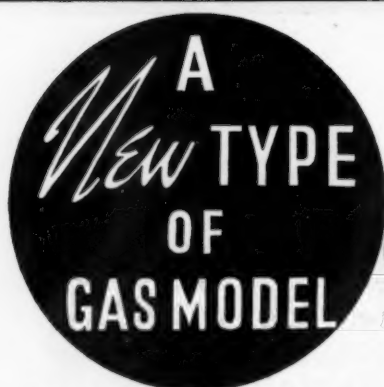
Please tell me how I can get a **NEW Remington Noiseless Portable Typewriter**, plus a free typing course and carrying case, for only 10c a day. Also send me an illustrated catalog.

Name.....

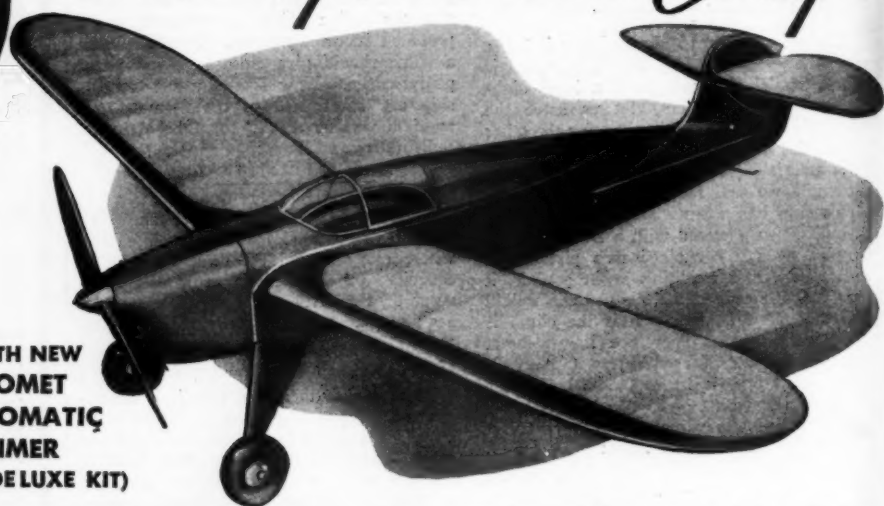
Address.....

City..... State.....

COMET'S *Two New*



The COMET *Golden Eagle*



Fly it as a

HIGH-WING



WITH NEW
COMET
AUTOMATIC
TIMER
(IN DELUXE KIT)

—especially designed for THE SMALL MOTOR!

COMET designers present gas model enthusiasts with a distinctly new type of gas model especially designed for a small motor. Tested hundreds of times in actual flights. Its versatility alone is enough to stamp it as unique—think of being able to fly a gas model in three different ways—as a high-wing, mid-wing, or low-wing—instantly interchangeable at the field in only a few seconds. The list of contents is impressive for its completeness.

Features of the GOLDEN EAGLE DeLuxe Kit

Wingspan 45"; Length 32½"; weight, ready to fly, including motor, 1 lb. Completely finished parts include Shaped and Rounded Leading Edges, Tapered Spars; Ribs die-cut; Shock-absorbing Bent Music Wire Landing Gear with streamlined Fairing; Semi-carved Propeller, Motor Mount ready to install; Adjustable Battery Mount; 1 pair Air Wheels; Removable Cowling for motor inspection; Motor, Cowl and Battery instantly removable in one unit for servicing; Motor may be mounted inverted or upright; Sliding Cabin Hood for access to Battery. All wire and metal Fittings furnished; Many finished and semi-finished Fittings; Full size 3-view Plans with full size Patterns; Bamboo Paper; Generous quantities of Cement, Banana Oil, and Red, Blue and Yellow Dope.

Kit No. T8—DeLuxe GOLDEN EAGLE. Price, including Air Wheels and Timer \$4.75
Standard GOLDEN EAGLE: Features identical with DeLuxe model. Bent Wire Fittings, Banana Oil and Cement included, no Dope, and a few of the simpler parts in unfinished form for those who prefer to do their own work. Special wheels included. Price **\$2.75**

Postage 25c, none if ordered from dealer. Above prices are less motors.
Condor Motor for above, \$18.50 Chuann Motor for above, \$17.50

FREE LEAFLET: "How To Adjust and Fly Gas Models," specially written for Comet by CARL GOLDBERG, given with each kit.

A LOW-WING



A MID-WING



COMET MODEL AIRPLANE & SUPPLY COMPANY

2509 West Cermak Road, CHICAGO • Dept. MN4 • Eastern Branch: 688 Broadway, NEW YORK

COMET maintains distributors in many cities throughout the United States and other parts of the world. Foreign distributors include: F. P. Sweeten, Blackpool, England; R. W. Hill, Capetown, South Africa; E. J. Hyams and Son, Wellington, C. I., New Zealand; Swift Model Aircraft Co., Brisbane, Queensland, Australia. PACIFIC COAST DISTRIBUTOR: Edw. Kapitanoff, 4649 Prospect Ave., Los Angeles, Calif.

SEE THESE SENSATIONAL NEW KITS AT YOUR DEALER'S NOW!

GAS MODELS!



THE *New* COMET Clipper

A NEW ACHIEVEMENT IN GAS MODELS
Designed for COMET by CARL GOLDBERG!



First and Foremost

DESIGNED
TO FLY!

—with the
NEW COMET AUTOMATIC TIMER

COMET takes a long stride forward in gas model design with the new COMET CLIPPER! Here is a model whose FLYABILITY can be certified in advance because it bears the stamp of the designing genius of CARL GOLDBERG! To this sensational new gas model, CARL GOLDBERG has given the full benefits of his sound, practical flying knowledge. First and foremost, the CLIPPER has been designed to FLY. It is a fitting climax to the success already achieved by Comet's Curtiss-Robin Gas Model. The price represents a new high in value-giving—a new triumph for Comet's straight-line volume production methods!

Kit No. T7—COMET CLIPPER. Price, including Timer . . . **\$4.95**

Comet Clipper Kit with air wheels . . . **\$6.90**

Postage 25c, none if ordered from dealer. Above prices are less motors. Ohlsson motor for above, \$18.50. Brown Jr. motor \$21.50.

READ ALL THE FASCINATING DETAILS!

- ① **TEST AFTER TEST**—hundreds of actual flights were made before CARL GOLDBERG placed his final approval on the COMET CLIPPER! The amazing FLYABILITY of this remarkable gas model is a matter of record!
- ② Wingspan, 6 ft.; Length, 53½ in. Weight (ready to fly), 2 lbs., 5 oz. Wing Loading, ½ lb. per sq. ft. WING AND TAIL instantly and easily detachable for transportation to flying field.
- ③ New Comet automatic timer included free. Weighs less than one oz. Adjustable from 10 to 50 seconds.
- ④ Completely finished parts include Shaped Leading Edges. Tapered Spars. Motor can be installed upright or inverted. Ribs die cut. Shock-Absorbing Bent Music Wire Landing Gear with Stream-

lined Fairing; Semi-carved propeller; Adjustable battery mount. Removable cowl for motor inspection: Motor, cowl and battery instantly removable in one unit for servicing: All wire and metal Fittings furnished.

- ⑤ Many finished and semi-finished Fittings: Full size three-view Plans with full size Patterns: Bamboo Paper: Generous quantities of Cement, Banana Oil, Red and Light Blue Dope. Special light weight wheels, newly designed motor mount—adjustable for any motor, semi-finished detachable cowl, all necessary screws, nuts and lockwashers, etc.
- ⑥ **FREE LEAFLET:** "How To Adjust and Fly Gas Models," specially written for Comet by Carl Goldberg, given with each kit.

NEW 28-PAGE COMET CATALOG—JUST OUT! 5c at your dealer! Over 100 Kits!
Complete line of Supplies and GAS MODEL ACCESSORIES

Send 10c for Complete 1938 Catalog

CLEVELAND MUEHL & SUPPLY CO., INC.

of track; includes Roadbed, Ballast, (Paving only)
ties, Rails, and other accessories. (If ordered with parts only
one 10c regular price charge necessary.)

See our big
ad on page
100